



FAIRSFair

Fostering Fair Data Practices in Europe

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D3.8 FINAL REPORT ON POLICY AND PRACTICE RECOMMENDATIONS AND SUPPORT

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Abstract

This report summarises the work undertaken by FAIRsFAIR WP3: FAIR Data Policy and Practice to address some of the key recommendations that emerged during the landscaping activities undertaken during the early stage of the project. The report describes a range of support, resources and guidance developed to help three key stakeholder groups - namely policy makers, research communities and repositories - to progress towards the realisation of a FAIR data ecosystem.

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Disclaimer

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Abbreviations and Acronyms

ACME-FAIR	Assessing capability maturity and engagement with FAIR-enabling practice
B2FIND	EUDAT metadata indexing service and discovery portal
DCAT	Data Catalog Vocabulary
DDI-CDI	DDI Cross Domain Integration
EOSC	European Open Science Cloud
ESFRI	European Strategy Forum on Research Infrastructures
FAIR	Findable, Accessible, Interoperable, Reusable
PaNOSC	The Photon and Neutron Open Science Cloud
PID	Persistent Identifier
RDA	Research Data Alliance
RDI	Research Data Infrastructure
RPO	Research Performing Organisation
SSHOC	Social Sciences & Humanities Open Cloud
TFiR	Turning FAIR into Reality
WP	Work Package

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Executive Summary

Based on preliminary landscape assessments and subsequent series of recommendations, FAIRsFAIR WP3 developed a programme of targeted support and resources for policy makers, professional roles supporting research communities, and repository service providers to help increase their FAIR-enabling capabilities. As part of our practical support for these three key stakeholder groups, WP3 has delivered:

- 4 Policy Support Workshops
- 9 Repository Support Webinars
- 3 Metadata Catalogue Integration Workshops
- FAIR Data Policy Checklist to help policy makers self-assess their alignment with FAIR
- Guidance for organisations to assess 7 areas of capability maturity and engagement with FAIR-enabling practice
- More than 20 Implementation Stories providing real-life examples and inspiration for FAIR-enabling practices

This report describes the range of support activities undertaken by WP3 and the resulting resources available to support the community.

1. Introduction

The main objective of FAIRsFAIR Work Package 3: FAIR Data Policy and Practice was to support an increase in the production and reuse of FAIR data, thereby helping to realise the European Open Science Cloud (EOSC) vision. To this end, WP3 had a focus on supporting the development and enhancement of FAIR-aligned data policies and on guiding the uptake of FAIR data practices among both research communities and repository service providers.

To help scope the coordination and support activities of WP3 and FAIRsFAIR more generally, assessments of both the FAIR data policy and practice landscapes were carried out in parallel in late 2019. The findings were published in D3.1 FAIR Policy Landscape Analysis¹ and D3.2 FAIR Data Practice Analysis².

The landscape assessments were used to inform the development of two sets of practical recommendations which are presented in D3.3 Policy Enhancement Recommendations³ and D3.4 Recommendations on practice to support FAIR data principles⁴. Specific recommendations to help repositories become more FAIR-enabling were also outlined in D3.5 Description of FAIRsFAIR's Transition Support Programme for Repositories⁵. A selection of the key recommendations presented in these three deliverables includes:

Policy enhancement recommendations:

- Policies themselves should be FAIR through the use of persistent identifiers (PIDs), repositories and structured description.

¹ Davidson, Joy, Engelhardt, Claudia, Proudman, Vanessa, Stoy, Lennart, & Whyte, Angus. (2019). D3.1 FAIR Policy Landscape Analysis (v1.0). FAIRsFAIR. <https://doi.org/10.5281/zenodo.5537032>

² Whyte, Angus, Engelhardt, Claudia, Bangert, Daniel, Kayumbi-Kabeya, Gabin, Lambert, Simon, Thorley, Mark, O'Connor, Ryan, Herterich, Patricia, & Davidson, Joy. (2019). D3.2 FAIR Data Practice Analysis (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5362079>

³ Davidson, Joy, Grootveld, Marjan, Whyte, Angus, Herterich, Patricia, Engelhardt, Claudia, Stoy, Lennart, & Proudman, Vanessa. (2020). D3.3 Policy Enhancement Recommendations (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5362183>

⁴ Molloy, Laura, Nordling, Josefine, Grootveld, Marjan, van Horik, René, Whyte, Angus, Davidson, Joy, Herterich, Patricia, Martin, Ivan, Méndez, Eva, Principe, Pedro, Vieira, André, & Asmi, Ari. (2020). D3.4 Recommendations on practice to support FAIR data principles (1.1). Zenodo. <https://doi.org/10.5281/zenodo.5357329>

⁵ Grootveld, Marjan, Davidson, Joy, Whyte, Angus, & Van Horik, René. (2020). D3.5 Description of FAIRsFAIR's Transition Support Programme for Repositories (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5362210>

- Policy makers should strengthen their expectations around the sharing of both data and metadata.
- Data management planning requirements should be harmonised across the policies of different stakeholders and include clear requirements for updates leading to high-quality, end stage DMPs.

Recommendations to support practice in research communities:

- There is a need to develop a capability model to help organisations self-assess their practices and plan to become more FAIR-enabling
- Developing an inventory of FAIR good practice would help to guide implementation and inspire uptake of FAIR-enabling practices

Recommendations to help repositories become more FAIR-enabling

- Improve the findability of repositories, their content, and related policies
- Improve the visibility and linkage potential of data holdings through the use of Persistent Identifiers for a range of different entities, such as scholarly outputs, researchers, organisations and research funders
- Provide support to help repositories self-assess their ability to support FAIR data provision

Based on the preliminary landscape assessments and the subsequent recommendations, FAIRsFAIR WP3 developed a programme of targeted support and resources for each of the key stakeholder groups to help increase their FAIR-enabling capabilities. This report outlines the range of support activities and resources developed and is structured to present the support activities developed for our three key stakeholder groups - policy makers, research communities and repository service providers. A table outlining the various resources is presented in Annex 1.

2. Policy Support Programme

As stated in Turning FAIR into Reality (TFiR),⁶ policies play a crucial role in realising and governing a FAIR ecosystem. A key priority for FAIRsFAIR was to engage with funders, academic institutions and other key stakeholders to help reduce conflicting policy requirements across stakeholders and to make the policy landscape easier to navigate. To this end, we developed a policy support programme to enable us to work with a cohort of policy makers to enhance existing policies and support the development of new, FAIR-aligned policies which include coherent statements on the responsibilities and actions needed to enable FAIR data.

⁶ Directorate General for Research and Innovation (European Commission). Turning FAIR into reality. <https://doi.org/10.2777/1524> (2018).

2.1 Policy enhancement recommendations

Based on the initial landscape assessment and the work of related initiatives, FAIRsFAIR prepared a series of practical recommendations⁷ for enhancing the broader policy environment to support the realisation of a FAIR ecosystem. The recommendations are presented under each of the three stages outlined by the Turning FAIR into Reality Report - that is, Define, Implement, and Embed & Sustain - to help assess progress towards the priority and supporting actions. FAIRsFAIR used various channels to raise awareness of these recommendations amongst policy makers in Europe. The project shared results in the SPARC Europe Analysis of Open Science Policies in Europe bi-annual reports⁸ and through regular meetings with the EOSC National Policies and Governance Task Force. In addition, the policy enhancement recommendations were presented at various FAIRsFAIR roadshows and international events in 2021 including the RDA4EOSC Webinar - Supporting the alignment of organisational research data management policies, EOSC Symposium, Open Science Fair in October 2021⁹, and the Laserlab-Europe, ELI and CASUS Better Data for Better Science - RDM Workshop¹⁰. FAIRsFAIR was also invited to present its policy work at a Science Europe members-only event in January 2021.

2.2 Open Call for support



An open call for policy enhancement support was launched in late 2020. The call invited expressions of interest from policy makers at all levels to work with us to assess their current policies against our policy enhancement recommendations and to consider how the policies might be adapted to support the emergence of a FAIR ecosystem better. We aimed to work with a range of policy makers and made our selection to ensure there was representation from different stakeholder groups (national, funding body, organisational, research infrastructure), different stages of policy development, and geographic coverage. The call for expressions of interest was open from December 2020 to February 2021. More than 70 expressions of interest were received.

⁷ <https://fairsfair.eu/policy-landscape-assessment-and-enhancement-recommendations>

⁸ <https://sparceurope.org/what-we-do/open-data/sparc-europe-open-data-resources/>

⁹ <https://www.rd-alliance.org/rda4eosc-webinar-supporting-alignment-organisational-research-data-management-policies>

¹⁰ <https://www.laserlab-europe.eu/events-1/laserlab-events/2021/data-management>

2.3 Policy support offer

From the expressions of interest received, FAIRsFAIR identified four groups of policymakers that were interested in receiving support. These include:

- Those who already had a policy in place
- Those who had a draft policy in development
- Those who were in the planning stages of policy development
- Umbrella organisations aiming to support a wider community of policymakers

FAIRsFAIR developed a support offer to allow us to work slightly differently with each of the four cohorts, however, all participants were invited to join three online workshops. Below we outline what FAIRsFAIR provided for each of the four cohorts along with what was required from participants in the support programme.

FAIRsFAIR support offered:

- For those with policies or draft policies, FAIRsFAIR carried out a review of these against our set of policy enhancement recommendations and provided a summary report outlining the results and suggestions.
- For those with policies in place and in development, FAIRsFAIR provided guidance on creating a structured version of their policy that can be made available to support human and machine readability.
- FAIRsFAIR organised three online workshops to share good practice and support policy development and refinement further full cohort.

What did we ask of those participating?

The FAIRsFAIR support offer made clear we expected those taking part to:

- Provide access to the policy or draft policy to be reviewed (if applicable).
- Participate in the three workshops wherever possible. These were scheduled through collaborative polling.
- Agree to FAIRsFAIR sharing any examples of good practice identified within their policy.
- Allow the name of the participating organisation being represented in the cohort to be displayed via the FAIRsFAIR website.

2.4 Participants in the policy support cohort

FAIRsFAIR selected a cohort of 20 policymakers to work with. Our main focus was to ensure we had representation from different stakeholder groups (national level, funding bodies and research performing organisations) and to provide support to European policy makers. However, we also wanted to ensure that a few participants beyond Europe were included to reflect the global nature of research. A list of the different organisations we worked with is presented in Figure 1.

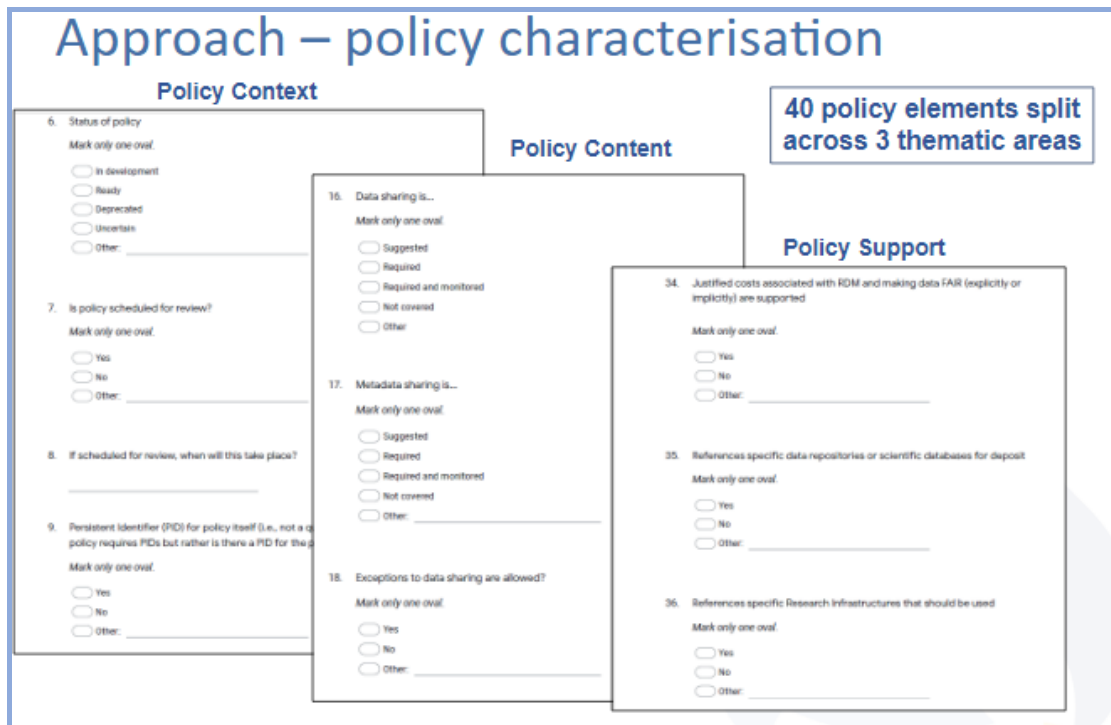
Figure 1. FAIRsFAIR Policy Support Cohort Members

Research Performing Organisations	Funding bodies	National level
The Glasgow School of Art	Research Council of Norway	Republic of Slovenia
Erasmus University Rotterdam	The Dutch Research Council	National Open Research Forum Ireland
Friedrich Schiller University Jena	National Health and Medical Research Council of Australia	Tetiaroa Society
University of Oxford		
Universiteit Ghent	20 policy makers in the cohort <ul style="list-style-type: none"> • 10 with policies in place • 2 with draft policies • 5 at the early planning stages • 3 umbrella organisations 	
University of Oulu		
University of Coimbra		
Middlesex University London		
Politecnico di Torino		
Scotland's Rural College		
University Graz		
Vrije Universiteit Brussel		
Banaras Hindu University		
Open Data Infrastructure for Social Science and Economic Innovations		

2.5 Policy reviews

We made use of a slightly refined version of the policy characterisation features¹¹ that we developed to allow us to compare the content of various stakeholders' policies during our initial landscape assessment. The policy characterisation features that were defined for this purpose reflected and built upon the work already carried out by related initiatives. For more on the development of the policy characterisation elements, please see the methodology section presented in D3.1 FAIR Policy Landscape Analysis¹².

Figure 2. Policy Characterisation form



Approach – policy characterisation

Policy Context

6. Status of policy
 Mark only one oval.
 In development
 Ready
 Deprecated
 Uncertain
 Other: _____

7. Is policy scheduled for review?
 Mark only one oval.
 Yes
 No
 Other: _____

8. If scheduled for review, when will this take place?

9. Persistent Identifier (PID) for policy itself (i.e., not a repository policy requires PIDs but rather is there a PID for the policy)
 Mark only one oval.
 Yes
 No
 Other: _____

Policy Content

16. Data sharing is...
 Mark only one oval.
 Suggested
 Required
 Required and monitored
 Not covered
 Other: _____

17. Metadata sharing is...
 Mark only one oval.
 Suggested
 Required
 Required and monitored
 Not covered
 Other: _____

18. Exceptions to data sharing are allowed?
 Mark only one oval.
 Yes
 No
 Other: _____

Policy Support

34. Justified costs associated with RDM and making data FAIR (explicitly or implicitly) are supported
 Mark only one oval.
 Yes
 No
 Other: _____

35. References specific data repositories or scientific databases for deposit
 Mark only one oval.
 Yes
 No
 Other: _____

36. References specific Research Infrastructures that should be used
 Mark only one oval.
 Yes
 No
 Other: _____

40 policy elements split across 3 thematic areas

¹¹ Joy Davidson, Claudia Engelhardt, Vanessa Proudman, & Lennart Stoy. (2019). FAIRsFAIR Policy Characterisation Data for D3.1 (1.0) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.3550544>

¹² Davidson, Joy, Engelhardt, Claudia, Proudman, Vanessa, Stoy, Lennart, & Whyte, Angus. (2019). D3.1 FAIR Policy Landscape Analysis (v1.0_draft). FAIRsFAIR. <https://doi.org/10.5281/zenodo.3558173>

A Google form¹³ was created to allow the reviewers to record their individual assessments and enable comparable results. The form was broken down into three sections: one looking at the **policy context**, one covering **policy content**, and a section looking at **support** for adhering with the policy. During the summer of 2021, the FAIRsFAIR team undertook their individual reviews of the policies provided by those in the cohort with policies in place or draft policies in development. A minimum of two reviewers assessed each policy. In most cases, three reviewers looked at each policy.

The individual assessments were combined to allow us to see where there was agreement and where views differed among reviewers for each of the policy elements. A consensus meeting was held to allow us to explore the reasons for differing opinions. In many cases, differing views reflected a lack of clarity in the policy leading to varying interpretations of what the policy expected. During the consensus meeting, a rapporteur was assigned for each of the policies reviewed, who worked with the other reviewers involved to reach a consensus view of the policy characterisation.

Once consensus had been reached, a report was prepared to provide feedback to each of the policy makers and offer recommendations on improving alignment with FAIR. A report template (see Annex 2) was developed to ensure that there was consistency in the feedback provided and in the recommendations offered. The policy report template aims to be applicable to a broad range of policy makers (national level, funding bodies and RPOs), so there will inevitably be some policy elements and related recommendations that are more relevant to some stakeholders than others. However, we felt that the full set of policy elements and recommendations would be useful for all types of policy makers. The report template followed the same structure used for the policy assessments and presented our findings and recommendations under the three headings of policy **context**, policy **content** and **support** for the policy. The use of the report template ensured we could provide consistent feedback to the participating policy makers. The use of a template also helps umbrella organisations in the cohort to reuse the instruments to provide support to their own members.

The report template has been refined based on some initial feedback from the policy support cohort participants and adapted to make it a usable resource for policy makers who were not part of the cohort. Our resulting draft FAIR Data Policy Checklist is intended to be an easy to use resource that helps policy makers at all levels to assess whether their policies align with the

¹³ FAIRsFAIR Policy Analysis Google form <https://forms.gle/o57dU4besbSfrSc87>

FAIR Principles. This draft was released for public consultation from January 17 to February 14th 2022, and an updated version based on the comments received is available via Zenodo¹⁴.

2.6 Policy support workshops





As part of the policy support offer, FAIRsFAIR organised three online workshops to help share good practices and support policy development and refinement.

The first workshop for the full cohort was held on October 28th, 2021 and presented an overview of the review approach and instruments used as well as providing a summary of the findings of the policy reviews. A week prior to the workshop, those policy makers in the cohort who had provided policies or draft policies for review were sent their individual feedback reports and asked to verify our assessment and provide any comments on the report findings and structure. We received a few requests for clarifications, but overall the policy makers stated that they agreed with our assessments and found the report format useful. Many of the cohort members requested that additional members of their organisation be able to attend the support workshops which we gladly encouraged.

Another key aim of the first workshop was to share examples of good practices that had been identified during the policy reviews with others in the support cohort. A couple of examples of good practices are presented in Table 1, and additional examples will be shared via the FAIRsFAIR website.

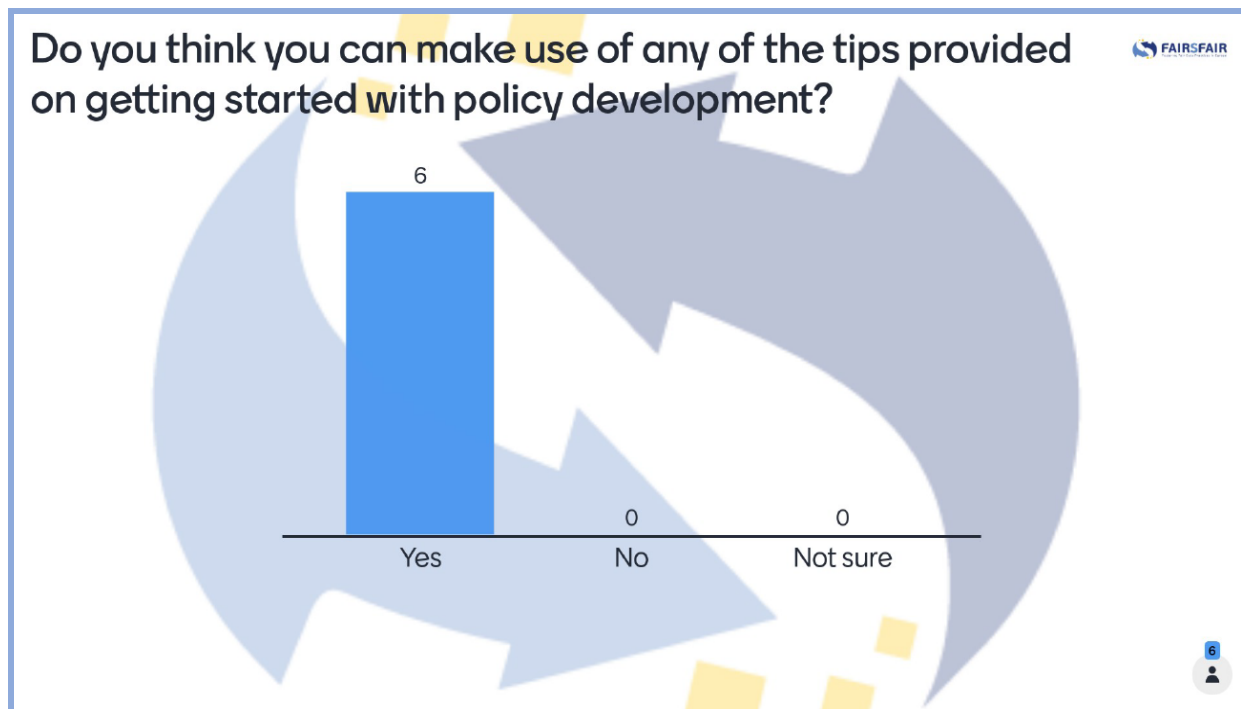
¹⁴ FAIR Data Policy Checklist <https://doi.org/10.5281/zenodo.6225775>

Table 1. Examples of good practice

Providing policy context	<div style="border: 1px solid black; padding: 10px;">  <h2 style="text-align: right;">Example of good practice</h2> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>THE GLASGOW SCHOOL OF ARTS</p> <p>Research Data Management Policy</p> </div> <div style="text-align: center;">  <p>https://www.gsa.ac.uk/media/1330796/gsa-research-data-management-policy-2016_10_25.pdf</p> </div> </div> <p>POLICY DETAILS:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Date of approval</td> <td>25th October 2016</td> </tr> <tr> <td>Approving body</td> <td>Research and Knowledge Exchange Committee (RKEC)</td> </tr> <tr> <td>Supersedes</td> <td>n/a</td> </tr> <tr> <td>Date of EIA</td> <td>30th September 2016</td> </tr> <tr> <td>Date of next review</td> <td>September 2017</td> </tr> <tr> <td>Author</td> <td>Nicola Siminon</td> </tr> <tr> <td>Responsible Executive Group area</td> <td>Research & Doctoral Studies</td> </tr> <tr> <td>Related policies and documents</td> <td>GSA Data Protection Policy; GSA Research Ethics Policy; GSA Open Access Policy; GSA Records Management Policy; GSA Policy for Staff Electronic File Backup; GSA Information Technology Security Policy; GSA Staff Acceptable IT Use Policy; GSA Museum and Archive Collections Development Policy; GSA Library Collections Strategy</td> </tr> <tr> <td>Benchmarking</td> <td>n/a</td> </tr> </table> <div style="margin-top: 20px;"> <p>Context:</p> <ul style="list-style-type: none"> Date approved Date of review Approving body Related policies and documents </div> </div>	Date of approval	25 th October 2016	Approving body	Research and Knowledge Exchange Committee (RKEC)	Supersedes	n/a	Date of EIA	30 th September 2016	Date of next review	September 2017	Author	Nicola Siminon	Responsible Executive Group area	Research & Doctoral Studies	Related policies and documents	GSA Data Protection Policy; GSA Research Ethics Policy; GSA Open Access Policy; GSA Records Management Policy; GSA Policy for Staff Electronic File Backup; GSA Information Technology Security Policy; GSA Staff Acceptable IT Use Policy; GSA Museum and Archive Collections Development Policy; GSA Library Collections Strategy	Benchmarking	n/a
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Benchmarking	n/a																		
Clarity on data sharing	<div style="border: 1px solid black; padding: 10px;">  <h2 style="text-align: right;">Example of good practice</h2> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>Research data management</p> <p>Responsible research data management is an essential component of good research practice. In addition to being safely stored and carefully curated, research data should be made available for reuse as widely and as early as possible. The guiding principle in this respect is 'as open as possible, as closed as necessary.'</p> <p>NWO therefore expects researchers to:</p> <ul style="list-style-type: none"> Carefully manage all research data generated as part of NWO funded projects; Preserve these data for at least ten years, unless legal provisions or discipline-specific guidelines dictate otherwise; As a minimum, share the research data that underlie research publications alongside those publications, unless this is prevented for reasons of privacy, public safety, ethical restrictions, property rights or commercial interests; Deposit research data in a trusted repository in such a way that the data are as findable, accessible, interoperable and reusable (FAIR) as possible. <p>NWO understands research data as the evidence that underpin the answer to research questions, and can be used to validate findings.</p> </div> <div style="text-align: center;">  <p>https://www.nwo.nl/en/research-data-management</p> </div> </div> <div style="margin-top: 20px;"> <ul style="list-style-type: none"> Clear on what data should be shared Clear about legitimate exemptions to sharing Clear on retention period of selected data </div> </div>																		

An **introduction to policy development** workshop was also delivered on October 28th, 2021 for those in the earliest stages of policy development and provided an overview of good practice and tips to consider when starting to plan policy development. The participants indicated through a Mentimeter poll that they found the advice provided useful for helping them to get started with their policy development.

Figure 3. Introductory level workshop menti poll - usefulness of the tips provided



The second and third workshops were provided back to back for the full cohort on February 16th, 2022. The second workshop focused on the role of structured policies in supporting the vision of the European Open Science Cloud and provided guidance on creating, updating and making **structured policy descriptions** accessible¹⁵. This workshop aimed to help to progress our recommendation of making policies themselves FAIR and to enable a more efficient approach to monitoring the policy landscape going forward. To this end, an open workshop was delivered on **Monitoring EOSC readiness: FAIR data policies**¹⁶. The target audience for this event included members of the policy support cohort. It was also open to a broader range of stakeholders who are interested in - or may need to contribute to - the ongoing monitoring of the

¹⁵ Creating and sharing structured policy descriptions <https://doi.org/10.5281/zenodo.6281106>

¹⁶ <https://fairsfair.eu/events/fairsfair-event/monitoring-eosc-readiness-fair-data-policies>

landscape at different levels. The event shared recent work undertaken by the EOSC Association to define key performance indicators relating to monitoring EOSC readiness; shared the key aims of an EOSC Steering Board Survey on policy monitoring currently being carried out with Member States; and introduced solutions being developed by EOSC Future, FAIRsharing and FAIRsFAIR to support comparable policy monitoring moving forward.

The third policy support workshop provided an overview of FAIRsFAIR’s Assessing Capability Maturity and Engagement with FAIR-enabling Practices (**ACME-FAIR**) framework¹⁷ along with guidance on how to carry out a self-assessment of organisational FAIR-enabling practices. The aim of this workshop was to help those in the cohort to assess their policy environment as one of seven thematic aspects of a FAIR-enabling organisation as well as identifying areas where improvement may be needed.

2.7 Impact

Overall, the policy support cohort indicated that they found the review reports clear and easy to interpret and that the recommendations were helpful. Written feedback was also provided by several members of the cohort and was very positive as summarised in Table 2.

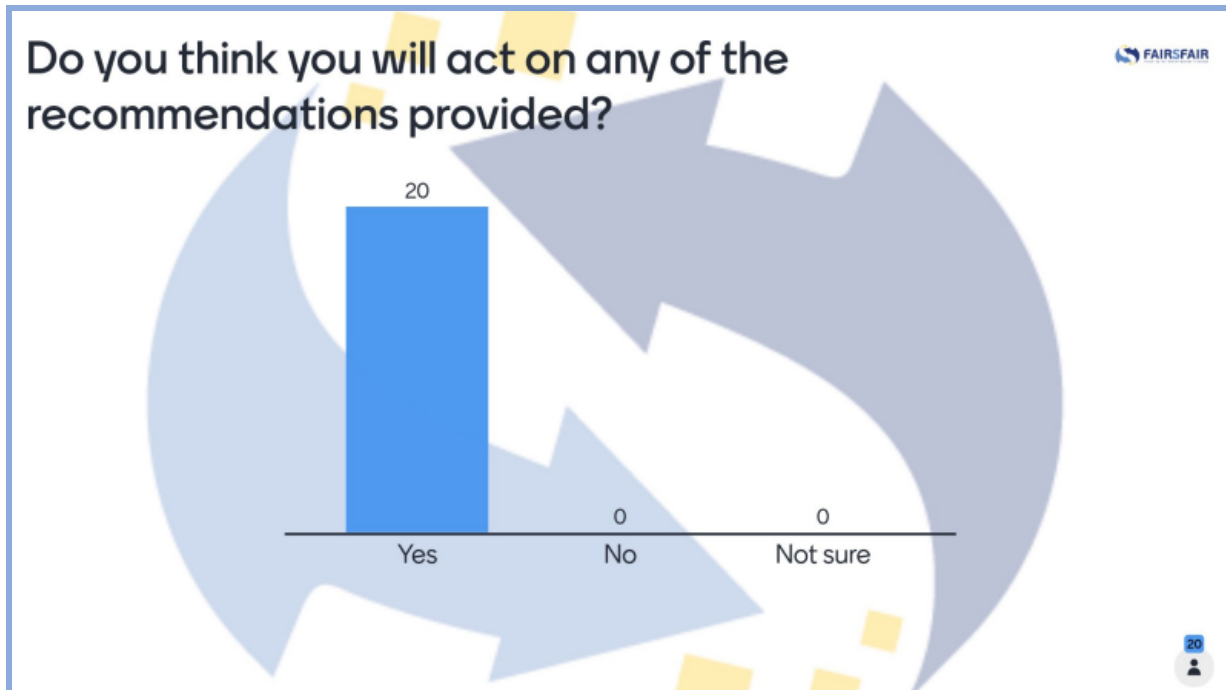
Table 2. Feedback received on Policy Support Programme

<p>There are a few areas where we knew our policy was lacking, for example, metadata sharing, and there are other areas to which we hadn’t paid much attention yet, such as data availability statements.</p>	<p>I think the report highlights nicely the shortcomings of our data policy. It should be easy for us to improve our current policy and also refine our guidelines based on the recommendations.</p>	<p>Thanks for the positive feedback and for the recommendations for improvement. We will take them into account in our next evaluation round.</p>	<p>I thought the report was very clear and insightful, and I agree with your assessment.</p>
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During the support workshops, we ran Mentimeter polls to get feedback on the instruments, the structure of the feedback reports and to see if the participants intended to take any actions in relation to the recommendations we provided. The feedback received showed that the majority of participants intended to take action in relation to the feedback they received (Figure 3).

¹⁷ ACME-FAIR <https://fairsfair.eu/acme-fair-guide-rpo>

Figure 4. Workshop 1 menti poll - intention to take action in relation to recommendations.



2.8 Key reusable resources

FAIRsFAIR's landscape assessment found that data policies that are clear and easy to understand can positively influence researchers in making their data FAIR. To support this recommendation and drawing on the instruments used during our policy support programme, we have developed an easy to use **FAIR data policy checklist** (Figure 5) to support policy makers at all levels in ensuring their policies align with the FAIR Principles and provide clarity on exactly what is expected of researchers.

Figure 5. Extract from the FAIR Data Policy Checklist

Policy element	Good practice recommendation	Tick the statement that best reflects your policy	
Title of the policy	To support findability, policies should have a title that makes clear whose policy it is and what the policy relates to.		<ul style="list-style-type: none"> The policy has a clear and appropriate title.
			<ul style="list-style-type: none"> The title of the policy would benefit from being made more explicit.
			<ul style="list-style-type: none"> The policy does not have a title.
Year the policy was introduced	To support both human interpretation and machine actionability, the policy should make clear the period of validity, differentiating between the date it was written and the date it was implemented where necessary.		<ul style="list-style-type: none"> The policy clearly states when it came into effect and provides a scheduled review date.
			<ul style="list-style-type: none"> The policy clearly states when it came into effect but does not provide a scheduled review date.
			<ul style="list-style-type: none"> The policy does not make clear when it came into effect or provide a scheduled review date.

Policy elements presented in the checklist are assessed as either being FAIR-aligned and clear (green) or not (red). For some elements, there is a third option which indicates that the element may align with FAIR to some degree but lacks sufficient rigour or clarity. The checklist was made available for public consultation between January 18th and February 14th, 2022 and refined based on the feedback received.

Building on the checklist, we also developed a **structured policy description template**¹⁸ and related **step by step guide**¹⁹ to help policy makers create and share structured versions of their data policies to support their reuse and comparison by those monitoring the policy landscape. This suggested approach was presented at the Monitoring EOSC readiness: FAIR data policies workshop on February 17, 2022.

¹⁸FAIRsFAIR Structured Policy Description Template <https://doi.org/10.5281/zenodo.6225938>

¹⁹Creating and sharing structured policy descriptions <https://doi.org/10.5281/zenodo.6225994>

3. Enabling FAIR Practice in Research Communities

3.1 Understanding the landscape of FAIR-enabling practice

The aim of the ‘practice’ element of FAIRsFAIR WP3 was to show how practices by researchers and data stewardship organisations can increase production and use of FAIR data, and to guide necessary enhancements. The practices we identified with this endeavour were broadly scoped by the recommendations for ‘culture change’ in the Turning FAIR into Reality report (TFIR).

The FAIR principles are intended to apply to all disciplines, in that they aim to maximise reusability of a wide range of research outputs, regardless of disciplinary origin.²⁰ Nevertheless, implementing the 15 principles requires definition and agreement of domain-relevant community standards and practices, as well as cross-community ones.²¹ Enabling FAIR therefore, means understanding enough about domain-relevant community cultures to identify where measures to enable adoption of FAIR practices can be used cost-effectively. That understanding can then help particular communities to agree on choices, e.g. of relevant (meta)data standards, and offer relevant tools and support to apply these standards.

Our FAIR data practice analysis offered a high-level overview of disciplinary initiatives to enable FAIR.²² It cited survey research indicating that overall awareness of FAIR among individual researchers was low. Nevertheless, we found evidence of initiatives in most communities, soon to be augmented by the EOSC disciplinary cluster project activities. Our study also pointed to the diversity in data practices, noting that disciplinary communities (or domains) vary on key characteristics known to influence data management and sharing.²³ Specific research community capability and capacity to make research objects FAIR will depend on domain characteristics, such as typical research team size, or methodological homogeneity. Coupled with these, the availability of institutional support and services is known to be critically important.

²⁰ Wilkinson, M., Dumontier, M., Aalbersberg, I. *et al.* The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* **3**, 160018 (2016). <https://doi.org/10.1038/sdata.2016.18>

²¹ Annika Jacobsen, Ricardo de Miranda Azevedo, Nick Juty, *et al.* FAIR Principles: Interpretations and Implementation Considerations. *Data Intelligence* 2020; 2 (1-2): 10–29. doi: https://doi.org/10.1162/dint_r_00024

²² Whyte, Angus, Engelhart, Claudia, Bangert, Daniel, Kayumbi-Kabeya, Gabin, Lambert, Simon, Thorley, Mark, O'Connor, Ryan, Herterich, Patricia, & Davidson, Joy. (2019). D3.2 FAIR Data Practice Analysis (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5362079>

²³ See section 2.3.3 in Whyte, Angus, Engelhart, Claudia, Bangert, Daniel, *et al.* (2019). D3.2 FAIR Data Practice Analysis (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5362079>

3.2 Recommendations to build FAIR data stewardship capabilities

The D3.4 Recommendations on practice to support FAIR data principles were targeted to “people in emerging roles that support researchers in the production and management of data, code and related research objects. Broadly speaking this is the practice of data stewardship... a shared responsibility of researchers and others to make data FAIR and keep it FAIR”.²⁴

Figure 6. Recommendations to support FAIR data practice

A: Develop and implement data sharing and interoperability frameworks

- A1: Describe research outputs using agreed terminologies and metadata standards to make data FAIR
- A2: Build a culture of data citation

B: Ensure data management is supported by data management plans (DMPs)

- B1: Formalise and support appropriate data management plans (DMPs) for FAIR data
- B2: Develop roadmaps, guidance and workflows for machine-actionable data management plans (DMP) to inform FAIR data stewardship

C: Develop professional support for FAIR data

- C1: Define and manage FAIR support costs and resources
- C2: Develop and implement models for coordinating and supporting data stewards and research software engineers
- C3: Develop and implement terminology for competence centres to annotate and retrieve training materials on enabling FAIR
- C4: Develop and implement a self-assessment framework for Research Infrastructures, institutions, and other FAIR competence centres

D: Ensure trusted curation of data

- D1: Develop and implement guidance and support for selection of appropriate trusted digital repositories (TDRs)
- D2: Develop and implement guidance and support for making sensitive data FAIR for reuse

The focus of WP3 guidance on implementing these recommendations was narrowed over the course of the project. Based on the landscape study, we considered two approaches for

²⁴ Molloy, Laura, Nordling, Josefine, Grootveld, Marjan, van Horik, René, Whyte, Angus, Davidson, Joy, Herterich, Patricia, Martin, Ivan, Méndez, Eva, Principe, Pedro, Vieira, André, & Asmi, Ari. (2020). D3.4 Recommendations on practice to support FAIR data principles (1.1). Zenodo.
<https://doi.org/10.5281/zenodo.5357329>

targeting these recommendations, and related guidance. The first was to find research communities that were seen as ‘gaps’ relative to their broader discipline, then find other communities using relatively advanced approaches to data management, and engage with repositories or Research Infrastructures likely to be interested in working directly with researchers in these communities to share approaches to making data FAIR.

An alternative approach that we adopted instead was to target the professional roles within institutional support services that are seen as important facilitators of FAIR data stewardship. These include data managers, librarians, research software engineers, and data stewards themselves.²⁵ This was on the expectation that engagement with these ‘data supporters’ would have a higher chance of success, and would avoid duplication of effort with the EOSC disciplinary clusters.

The D3.4 recommendations covered 4 broad themes drawn from the TFIR report and shown in Figure 6. WP3 partners identified a set of 7 themes to prioritise in developing supporting material for these recommendations. Initially set out in D3.2 and D3.4, these themes were revised in response to gaps identified through reports and discussion with input from FAIRsFAIR’s sister EOSC projects reported in the ‘Synchronisation Task Force’ reports.^{26,27,28} This led to more emphasis being given to two themes; ‘ensuring trustworthy curation’ and ‘selection of data, services and repositories for FAIR’. Priorities were also shaped through engaging with the RDA interest group on Professionalising Data Stewardship. In late 2020 this established various task groups to reflect this community’s priorities. To respond to these, WP3 gave additional emphasis to two areas; the contribution of recognition and reward to professionalisation of data support roles, and business models for embedding data stewardship in an organisation (see section below). The resulting 7 themes are listed below:

1. Defining the policy environment for FAIR
2. Developing sustainable business models

²⁵ European Commission, Directorate-General for Research and Innovation, *Digital skills for FAIR and Open Science : report from the EOSC Executive Board Skills and Training Working Group*, Manola, N.(editor), Lazzeri, E.(editor), Barker, M.(editor), Kuchma, I.(editor), Gaillard, V.(editor), Stoy, L.(editor), Publications Office, 2021, <https://data.europa.eu/doi/10.2777/59065>

²⁶ Coen, Gerard, Mokrane, Mustapha, Pittonet, Sara, Hodson, Simon, & van Kessel-Hagesteijn, Renee. (2020). D5.3 Report on the First Synchronisation Force Workshop (1.0). FAIRsFAIR. <https://doi.org/10.5281/zenodo.5361052>

²⁷ Ingrid Dillo, Marjan Grootveld, Simon Hodson, & Sara Pittonet Gaiarin. (2020). Second Report of the FAIRsFAIR Synchronisation Force (D5.5) (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5361417>

²⁸ Davidson, Joy, Dillo, Ingrid, Grootveld, Marjan, Hodson, Simon, & Pittonet Gaiarin, Sara. (2021). D5.6 Report 3 of the Synchronisation Force (V1.0_DRAFT). Zenodo. <https://doi.org/10.5281/zenodo.5595863>

3. Professionalising roles through training, mentoring and recognition
4. Supporting data management planning
5. Defining data interoperability frameworks
6. Selecting data, services, and repositories for FAIR
7. Ensuring trustworthy curation

3.3 Implementation stories about FAIR-enabling practice

The ‘implementation story’ format was conceived as a response to the following recommendations in Turning FAIR into Reality:

r4.2 “Examples of FAIR use cases and success stories should be developed to convince reluctant research communities of the benefits in defining their disciplinary interoperability framework.”

r4.4 “Mechanisms should be facilitated to promote the exchange of good practices and lessons learned in the implementation of FAIR practices both within and across disciplines.”

A template was designed for writing the Implementation Stories as brief (4-6 page) case studies, with the aim of sharing good practice and inspiring others to take similar action. Each story describes an approach taken by data support actors in one or more Research Performing Organisation or Research Data Infrastructure to help researchers produce or use FAIR data, either directly or by assisting professional support staff. The template covered these points:

- Introduction to the aims of the approach taken
- Recommendations relevant to the approach, from D3.4 or from TFIR
- Steps taken to implement the approach
- Challenges addressed so far
- Impacts found or expected

An interview protocol comprising interview questions and an informed consent process was developed. Partners identified and shortlisted potential interviewees from knowledge gained by participation in RDA groups, Synchronisation Force and other task forces, and personal contacts. Interviews were carried out online by the T3.3 partners, and notes were fed back to the interviewees for correction and comments. Interviewees were identified as contributing authors, and reviewed drafts of the stories. An internal review process also checked the coherence and readability of the narratives. Table 3 lists the themes and titles of the stories, and the organisations that contributed to these.

Table 3. Implementation Stories

Defining the policy environment	
Implementing a policy framework for environmental RDIs	ENVRI-FAIR
Implementing the PaNOSC/ ExPaNDS policy framework	PaNOSC, ExPaNDS
Developing sustainable business models	
Connecting data stewardship to research projects	Maastricht UMC, NL
Evolving research lifecycle support through data stewardship and research software engineering	Manchester University, UK
Bridging the support service gap for SSH researchers	University of Edinburgh, UK
Professionalising roles	
Developing a course for FAIR data in climate science	e-Science Centre/ TU Delft, NL
Celebrating all research outputs and the people who generate them: The hidden REF	Software Sustainability Institute, UK
A digital badge in responsible conduct of research	University College Cork, Ireland
Recognition and implementation of FAIR throughout the organisation	Utrecht University, NL
Supporting DMP	
Leveraging maDMPs to build RDM infrastructure	TU Wien, Austria
Tracking project outputs with maDMPs	California Digital Library, US
Aligning the workflows for DMPs, data protection and ethical compliance	University of Glasgow, UK
Data interoperability	
Making metadata FAIR for climate research	Danish eInfrastructure Consortium

Social dynamics of defining interoperability frameworks	RDA Social Dynamics of Interoperability IG
Development of the SSHOC reference ontology	SSHOC project
Developing the B2INST service for registering and persistently identifying instruments	SURF, NL
Selecting data, services, repositories	
Using a data value checklist to help researchers select data to make FAIR	NERC Centre for Environmental Data Analysis, UK
Defining Fairdata, a suite of services for research data producers and reusers	CSC, Finland
Two links in the research data lifecycle: collaboration between a university and long-term repository	Radboud University, NL
Ensuring trustworthy curation	
Making the case for FAIR data points	Leiden UMC and SURF, NL
Making data FAIR but not open	GESIS, Germany

3.4 Assessing capability maturity, engagement with FAIR (ACME-FAIR)

In parallel with the Implementation stories, WP3 developed the ‘ACME-FAIR’ capability model. This offers guidance for Research Producing Organisations to self-assess the maturity of their capabilities for FAIR data stewardship, and their engagement with communities developing standards in this area.

3.4.1 Drivers for ACME-FAIR

There were two main drivers for developing this guidance. The first was the lack of available models to assess the maturity of actions that organisations and communities were taking to implement the Turning FAIR into Reality report. Our landscape study concluded that such a model would be needed to help infrastructures and institutions identify progress to support FAIR enabling practices in the communities they serve. We envisaged this could “underpin further capability building, promote the exchange of good practices and lessons learned, and address

the highly uneven availability of information on research community implementation”. The second driver was the broader acceptance of capability maturity models. According to the OECD report on Building Digital Workforce Capacity and Skills for Data-intensive Science, a “general recommendation for any organisation or community is to evaluate and improve the maturity of their digital workforce capacity strategy. Maturity models are commonly used to help organisations assess effectiveness in a given area and to support understanding of what is needed to improve performance. They are most effective when linked with strategic leadership.”

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A timely source of strategic leadership followed with Science Europe’s 2021 publication, Practical Guide to Sustainable Research Data.³⁰ This included maturity matrices designed to allow funders, research performing organisations and data infrastructures to evaluate the current status of their policies and practices, and identify next steps to improve sustainability and align with other organisations in doing so. Given the close parallels with FAIRsFAIR aims, WP3 engaged with the Science Europe team in the drafting of their guide, and benefitted from contributions of their team to ACME FAIR. As a result, we were able to ensure a complementary approach, so that the Science Europe guide targets senior managers in organisations seeking a strategic-level assessment, while the FAIRsFAIR guide targets the operational level of the organisation.

3.4.2 Purpose and scope

The ACME-FAIR guides aim to be useful for services providing support to researchers on FAIR implementation, and have three main use cases:

1. For the service to self-assess its readiness to support FAIR, by establishing current and desired levels of communication and adoption of community practices and the organisational maturity of the support offered for these.
2. Provide a basis for dialogue with colleagues to set out a roadmap for improving on current support, e.g. through training and skills development to improve the communication and adoption of community practices.
3. Support sharing of consistent information between peer organisations about their current levels of maturity and community engagement around FAIR-enabling practices, e.g. with national or international coordination and facilitation.

The guides cover the same 7 themes (or ‘key issues’) as the Implementation Stories, and in turn the scope of the practice recommendations and the Turning FAIR into Reality report. The

²⁹ OECD (2020), “Building digital workforce capacity and skills for data-intensive science”, *OECD Science, Technology and Industry Policy Papers*, No. 90, OECD Publishing, Paris, <https://doi.org/10.1787/e08aa3bb-en>. (p.36)

³⁰ <https://www.scienceeurope.org/our-resources/practical-guide-to-sustainable-research-data/>

capabilities described within this scope are also informed by the WP3 partners prior work, namely the Digital Curation Centre's RISE self-evaluation framework for research data service development³¹, and the guide 'Do I-PASS for FAIR', which was produced with contributions from DANS in the context of the Dutch Coordination Point Research Data Management.³²

3.4.3 Assessment scales

ACME FAIR uses a two-dimensional scale, comprising three maturity levels for each of the seven issues, and three levels of communication and adoption of practice. The **maturity levels** are a simplified version of the first three levels of the widely adopted *CMMI* (Capability Maturity Model Integration) framework³³.

The levels of "**community engagement**" are separated out from maturity for the following reasons:

- Community engagement is essential for all of the practice areas covered.
- While the maturity goal of optimising alignment with *organisational* standards and practice is relevant to Research Performing Organisations, for research data support it is equally important to align with *community* standards, as defined by research domains and professional communities of practice.
- Identifying areas where maturity and engagement are at differing levels may be helpful to identify pockets of good practice in one or the other, or areas to target for further action.

The maturity and community engagement dimensions both indicate progression from ad-hoc project-level coverage of practice areas, through to organisation-wide integration. These levels are:

Maturity

1. **Initial.** May be incomplete and falling short of the intent of the area of focus. Aware of and addressing performance issues.
2. **Managed.** Complete coverage delivering the full intent of the area of focus, minimally in some aspects. Lacking full alignment with overall organisational standards and practice, but identifies and monitors performance objectives. Includes and builds on level 1.

³¹ Rans, J and Whyte, A. (2017). 'Using RISE, the Research Infrastructure Self-Evaluation Framework' v.1.1 Edinburgh: Digital Curation Centre: www.dcc.ac.uk/guidance/how-guides

³² Taco de Bruin, Sarah Coombs, Jutta de Jong, Irene Haslinger, Henk van den Hoogen, Frans Huigen, Mijke Jetten, Jacko Koster, Margriet Miedema, Sjeff Öllers, Inge Slouwerhof, Ingeborg Verheul, & Jacqueline Ringersma. (2020). Do I-PASS for FAIR. A self assessment tool to measure the FAIR-ness of an organization (Version 1). Zenodo. <https://doi.org/10.5281/zenodo.4080867>

³³ *** Reference to CCMI. e.g. https://en.wikipedia.org/wiki/Capability_Maturity_Model_Integration ***

3. **Defined.** Complete coverage that delivers the full intent of the area of focus and aligns with overall organisational standards and practice. Identifies and monitors performance objectives that expand alignment to the whole organisation. Includes and builds on level 2.

Community engagement: practice awareness, adoption, and collaboration

This dimension identifies the level of engagement the organisation (or the relevant services it offers) has with the communities it serves, about maintaining and updating data stewardship practices and identifying new areas for the development of policy and implementation standards. It includes actively communicating and promoting existing and emerging approaches to the immediately impacted communities and the wider data infrastructure landscape.

1. **Awareness:** the service monitors data stewardship practice in the community or communities it serves, and makes local practitioners aware of it.
2. **Adoption:** the service or its host organisation also supports practitioners to embed community practice locally.
3. **Collaboration:** the service also engages with the design, development, and review of community practice. Consults and collaborates widely, potentially also taking a community coordination and leadership role.

3.5 Additional guidance

WP3 also developed further guidance to complement ACME-FAIR on selected themes³⁴

- Across themes: training material recommendations contributed by EOSC projects, partly for this purpose and partly to populate a testbed of materials for FAIRsFAIR WP6 (Competence Centre)
- Defining the policy environment for FAIR: the policy evaluation checklist described in section 2.8
- Developing sustainable business models: key points from the results of a survey on organisational approaches to data stewardship, co-designed with the RDA Professionalising data stewardship Interest Group (PDS-IG) and conducted in late 2021.
- Supporting data management planning: an annotated version of the Science Europe DMP assessment rubric, offering additional detail on FAIR for data stewards and others using this rubric to give feedback on a DMP.
- Defining data interoperability frameworks: a short guide on PID Graph, and report on using Jupyter notebooks to extract and visualise information about project outputs and

³⁴ References to these outputs will be added before the accepted version of this deliverable is uploaded

their relationships to project DMPs, based on the publicly available metadata attached to their persistent identifiers.

3.6 Impacts

The Implementation Stories were released in the final month of the project. Although access figures were unavailable at the time of writing, potential impacts were identified through discussion of their value for two related purposes;

- As reference materials for future training courses, including the CODATA Data Stewardship Schools, metadata about the stories will be made available to the EOSC Future training materials registry.
- As a form of publication, the story format will be adopted by *International Journal of Digital Curation* for a new ‘brief report’ paper category, offering a means for data support professionals to gain recognition of their approaches to implementing FAIR. Approaches are also being made to journals that similarly include FAIR data management in their subject scope.

The ACME-FAIR guidance was released in draft form for consultation between December 2021 and February 2022. An indication of interest in the first 5 (of 7) topics released can be gained from Zenodo downloads and page views, as follows.

Table 4 ACME-FAIR usage statistics

Theme	Date released	Views	Downloads
Defining the policy environment for FAIR	5.1.2022	178	135
Professionalising roles through training, mentoring and recognition	25.11.2021	383	279
Supporting data management planning	12.1.2022	270	191
Defining data interoperability frameworks	13.12.2021	175	119
Ensuring trustworthy curation	15.12.2021	170	115

(at 1st February 2022)

Feedback on the relevance and usefulness of ACME-FAIR has been gained from three applications of it coordinated by University of Helsinki, and from an online form made available with the public consultation drafts.

The online form invited readers of the guides to state (anonymously) how far they agreed with the four statements below, on a scale of 1 (low) to 5 (high). Although few responses to the form have been received to date these were generally positive. The figures in brackets are the % of respondents giving ratings of 4 or 5.

- The overall purpose of ACME-FAIR is described clearly enough for its target audience of research data stewards and related research support professionals (75%)
- The scope of the FAIR-enabling ‘key issues’ in ACME-FAIR describes what Research Performing Organisations should be able to do to support FAIR data management (87.5%)
- It is helpful for ACME-FAIR to use two dimensions; one dimension describing levels of alignment with organisational standards and practice; the other dimension describing local engagement with relevant community standards. (87.5%)
- I would expect colleagues to find ACME-FAIR a useful aid to identifying areas of improvement in our support for FAIR data management (62.5%)

Comments gave helpful suggestions to clarify some of the introductory material and the capability statements themselves, and these have been acted upon in the final version.

The evaluation by University of Helsinki Library was coordinated by their RDM Coordinator and involved three groups, each of which applied the ACME guides relevant to their situation in separate 90 minute workshops;

- The Finnish national support office for the DMP Tuuli service to support Data Management Planning, where four members of staff applied the relevant ACME guide to inform their planning.
- University of Helsinki expert group of 5 people who applied the ‘Developing the policy environment’ guide in the process of updating the University data policy and creating a roadmap of steps to implement this.
- Data Support Network coordinated by University of Helsinki, comprising 20 people drawn from various staff units, primarily the Library, Research Office, and IT service. 16 members were involved in using ACME.

The outcomes were, in general terms, very positive, while identifying several areas where improvements could be made. A summary of the outcomes is included in Annex 3 to this report.

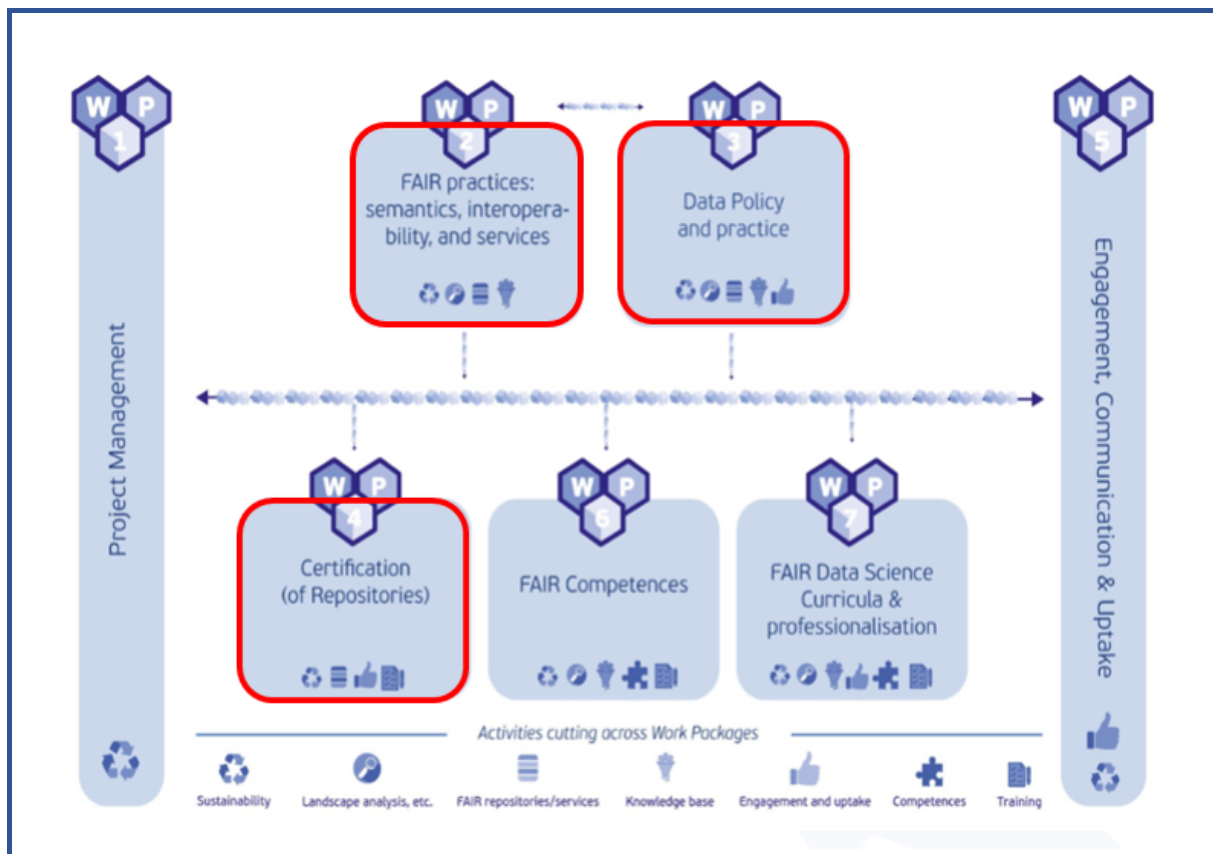
3.7 Key exploitable results

The Implementation Stories and the ACME-FAIR guidance are both key exploitable results for FAIRSF AIR. Access will be maintained to these outputs both through the FAIRSF AIR website and through the Zenodo community dedicated to the project.

4. Supporting Repositories to become more FAIR-enabling

Digital repositories play a critical role in enabling the availability of FAIR data and helping to ensure that it is kept FAIR over time. As a key stakeholder group, FAIRsFAIR has engaged with, guided, and supported repositories through the work of three of the project’s work packages (WP2, WP3, and WP4 as shown in Figure 7).

Figure 7. FAIRsFAIR work packages targeting repositories



4.1 Summary of FAIRsFAIR Repository Support

Based on responses to an open call, WP2 worked with 12 selected repositories to design and test implementation features to enable and increase interoperability of the (meta)data. Also, based on responses to an open call, WP4 selected a cohort of 10 repositories to receive dedicated support to work toward CoreTrustSeal certification³⁵. In addition to the dedicated support provided to these selected repositories, FAIRsFAIR aimed to reach a broader range of repositories to help them begin and/or progress their journey towards becoming FAIR-enabling. Below, we outline a series of support activities undertaken in WP3 to reach a wider audience.

4.2 Repository Support Webinar series



FAIRsFAIR developed a series of Repository Support Webinars³⁶ which aimed to help repository managers become familiar with FAIR-enabling practices. The webinar format enabled us to proceed virtually, meaning we were not affected by COVID-19 travel restrictions. To ensure that time commitment was not a barrier to participation, each webinar was limited to a maximum of 1.5 hours in length. A standard format for delivery was employed, which included a general introduction to the topic and highlighting its relevance to the FAIR Principles. A Mentimeter poll was used during the introduction to help us to get a sense of the audience's make-up and their current levels of familiarity and engagement with the webinar topic. Each webinar then moved on to provide one or more examples of current activity, followed by time for open questions and discussion between the speakers and the participants. The webinars concluded with a summary of take-away messages and practical recommendations for participants. A final menti poll asked participants whether they intended to take any action based on what they had heard during the webinar.

4.3 Webinar topics

Over the course of 2021-22, a total of nine webinars were delivered to address some of the recommended actions and support areas identified in D3.5 Description of FAIRsFAIR's

³⁵ The list of 22 supported repositories is available from <https://fairsfair.eu/application-results-open-call-data-repositories>

³⁶ <https://fairsfair.eu/events/webinars/repository-support-webinars>

Transition Support Programme for Repositories³⁷. A key objective for these webinars was to ensure that tools, approaches and good practices emerging through the dedicated support programmes delivered by WP2 and WP4 could be amplified to reach a broader audience of repository staff. Below, we provide a list of the nine webinars delivered along with a summary of the webinar content.

The role of Repositories in enabling Persistent Identifier (PID) Graphs

PIDs enable the unique identification of digital entities and provide a way for us to refer to entities in a persistent way. As such, they play a central role in realising a FAIR ecosystem. The power of PIDs is amplified further when they are connected with each other creating a PID Graph. This webinar explored the concept of the PID Graph and their potential usefulness for repositories. The session included recent developments from the FREYA project³⁸ as DataCite and the RDA Interest Group on Open Science Graphs for FAIR Data³⁹.

FAIR-enabling Services Framework

WP2 colleagues developed a framework for assessing FAIR-enabling services⁴⁰. The framework aims to help service providers assess how FAIR-enabling their current practices are and provides practical guidance on areas where improvements might be made. The first of two webinars on the assessment framework was delivered by WP2 in May 2021 to introduce the draft and seek feedback from the community. The updated framework was published in August 2021 and a second webinar was delivered in February 2022 to provide practical tips on applying the framework.

Using registries to improve the visibility of your repository service

This webinar introduced two leading registry services - re3data and FAIRsharing - and helped participants to understand how using these services can improve the visibility of repository services for a wide range of end users - both humans and machines. The speakers provided practical tips on what information should be included in repository registry records to maximise

³⁷ Grootveld, Marjan, Davidson, Joy, Whyte, Angus, & Van Horik, René. (2020). D3.5 Description of FAIRSFAR's Transition Support Programme for Repositories (1.0). Zenodo.

<https://doi.org/10.5281/zenodo.5362210>

³⁸ <https://www.project-freya.eu/en>

³⁹ <https://www.rd-alliance.org/groups/open-science-graphs-fair-data-ig>

⁴⁰ Ramezani, Sara, Aalto, Tero, Gruenpeter, Morane, Herterich, Patricia, Hooft, Rob, & Koers, Hylke. (2021). D2.7 Framework for assessing FAIR Services (V1.0_DRAFT). Zenodo.

<https://doi.org/10.5281/zenodo.5336234>

the visibility of the service. This webinar was delivered in cooperation with WP4 and helped to promote the work undertaken in that WP to improve the description of data repositories⁴¹.

Metadata exchange issues - when standard meets reality. Lessons learned from B2FIND

The effective exchange of metadata is critical for supporting a FAIR data ecosystem where researchers can seamlessly search for and access research data held in multiple repositories. This becomes tricky when research data from different scientific disciplines are ingested, using a variety of standards, divergent formats, and multiple levels of granularity. While in an ideal world, all metadata schemas and standards are fully interoperable, in reality, they are not yet. Through two webinars, practical experiences on the interdisciplinary discovery portal B2FIND were shared along with practical tips on how to support findability and metadata exchange from the metadata aggregator perspective.

Assessing the FAIRness of data holdings: Using F-UJI to make your repository more FAIR-enabling

This webinar was run in cooperation with WP4 and introduced the F-UJI assessment tool, which was developed in that WP to support the programmatic assessment of seventeen minimum viable metrics for FAIR data objects. The webinar provided guidance on how to scope and carry out an assessment, how to interpret the results and to identify areas of service provision where improvements may be needed.

Certified Digital Preservation: Practical tips for repositories on aligning with CoreTrustSeal in their Digital Preservation policies

This webinar was also run in cooperation with WP4 and shared practical advice on developing digital preservation policies including a case study from one of the repositories supported by WP4 to apply for CoreTrustSeal (CTS). This webinar was intended to be of value to repositories considering CTS certification but equally to any repository wishing to develop or review their digital preservation policies.

Using the DCAT (Data Catalog) vocabulary to support metadata catalogue integration

This webinar aimed to raise awareness of the potential value of the Data Catalogue Vocabulary (DCAT) in supporting metadata catalogue integration among members of the repository community. DCAT is a W3C standard that was initially oriented towards governmental data but has been extended to cover research data. DCAT v3 is the latest version, and a summary of the

⁴¹ Sarala Wimalaratne, & Robert Ulrich. (2020). M4.7 Improved Description of Data Repositories (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5471811>

changes was provided during the webinar along with tips on implementing DCAT. This webinar targeted data repositories and aggregator service providers wishing to make metadata catalogues more visible and interoperable.

4.4 Overview of Repository Support Webinar participants

The webinar series attracted almost 900 registrants from 46 countries. The majority of webinar participants were based in Europe. However, as research is global in nature, we were pleased that a very high number of participants joined from countries outside the EU. The majority of webinar participants were those representing Universities and Research Performing Organisations. Participation also included representatives from Research Funding Organisations and National Agencies, small-medium enterprises (SMEs) and museums.

4.5 Metadata Catalogue Integration

The emergence of an ecosystem where FAIR data reuse becomes the norm depends upon researchers' ability to search for and find suitable data held across multiple repositories. For this to happen, repository and aggregator service providers must reach agreement on common metadata catalogue standards to support interoperability. In 2020, FAIRSFAR undertook an analysis of metadata cataloguing activity among different domain-specific research data infrastructures and research data repositories. Through a series of workshops, metadata catalogue integration challenges were explored with representatives of domain specific repositories, which led to the D3.6 Proposal on integration of metadata catalogues to support cross-disciplinary FAIR uptake⁴². The deliverable analysed domain-agnostic metadata standards and proposed an ambitious pilot activity to assess the feasibility of either DCAT v2 and DDI-CDI to support metadata catalogue integration. The pilot aimed to involve domain-specific participants to create mappings from domain-specific standards to DCAT v2 and DDI-CDI and the participating aggregator service to implement a DCAT reader.

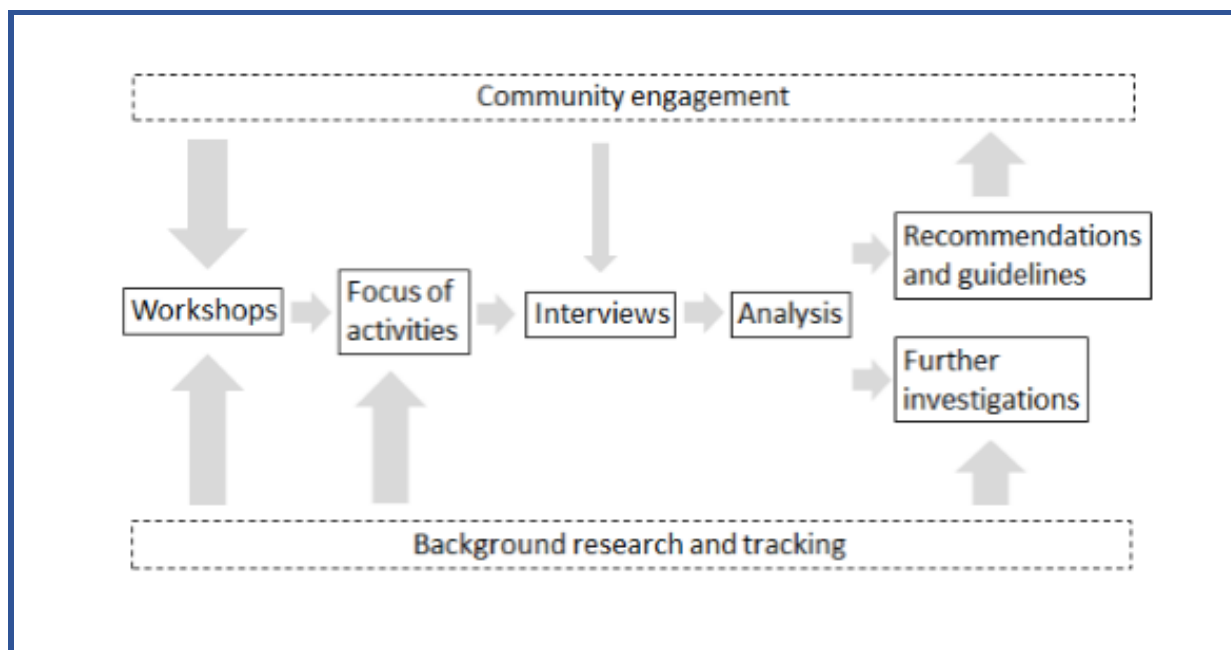
Following a third workshop with the stakeholders to devise a concrete action plan in early 2021, the proposed pilot was reduced in scope as it became clear that despite the willingness among the stakeholders to take part in principle, there simply was insufficient resource to enable this in a practical sense. The pilot instead focused on identifying different domain perspectives about the suitability of DCAT v2, planned improvements for DCAT v3 and to consider some of the additional practical implementation factors that need to be addressed to facilitate broader

⁴² Eva Mendez, Tony Hernandez, Angus Whyte, & Joy Davidson. (2020). D3.6 Proposal on integration of metadata catalogues to support cross-disciplinary FAIR uptake (1.0 DRAFT). Zenodo.
<https://doi.org/10.5281/zenodo.4134788>

uptake. The revised methodology involved carrying out a series of in-depth interviews with two domain specific repositories and two aggregator services (shown in Figure 7).

During the pilot, the WP3 team worked with representatives from two of the thematic cluster projects (SSHOC and PaNOSC) and two service providers (B2FIND and OpenAIRE) to assess the feasibility of DCAT v2 from both the domain specific and aggregator perspectives. In all cases, there was a positive attitude to DCAT’s potential to support catalogue integration and no major technical obstacles were identified. Rather, the key challenge hindering uptake appears to be related to a current lack of demand for aggregator services to implement DCAT harvesting from the repositories they serve and a lack of access to a central documented collection of metadata mappings. The pilot also revealed that DCAT and DDI-CDI should not be viewed as competing but rather complementary standards with DCAT addressing discoverability at the collection level and DDI-CDI addressing interoperability at the dataset level. The findings are presented in D3.7 Report on integration of metadata catalogues⁴³. To support greater awareness of the potential of DCAT to support metadata catalogue integration among repository service providers, a Repository Support Webinar on the topic was delivered in February 2022.

Figure 8. Revised metadata catalogue integration pilot methodology

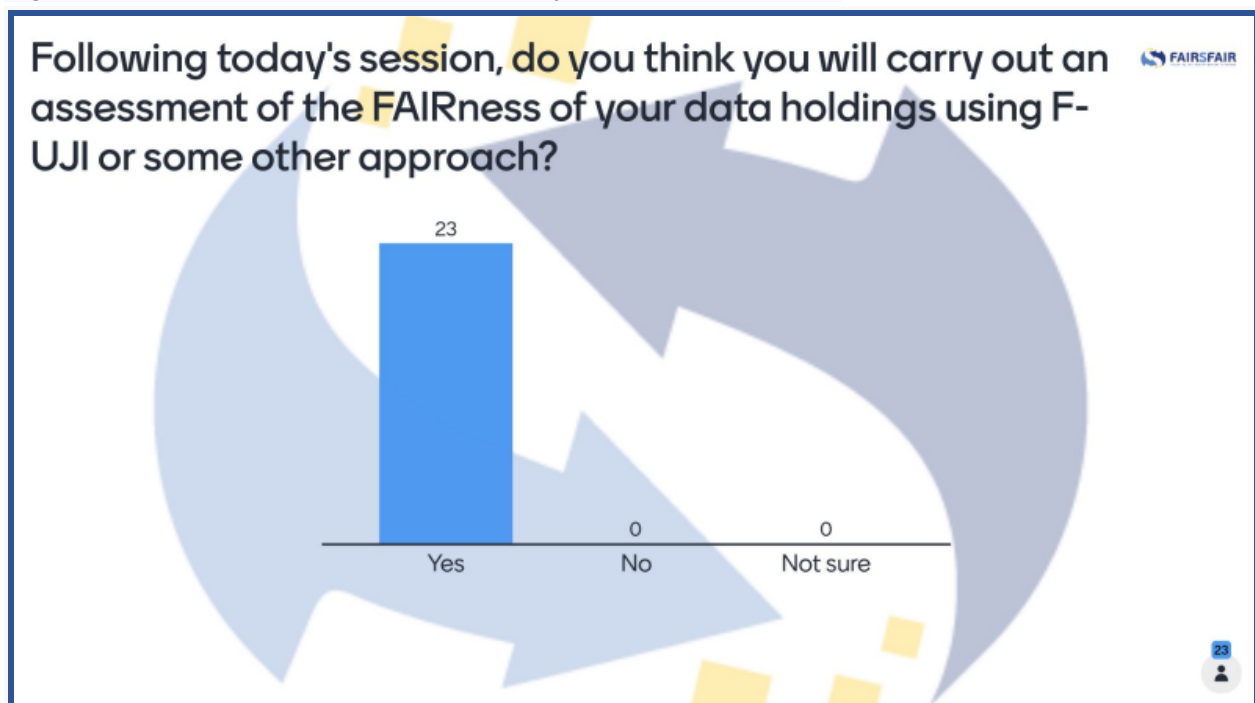


⁴³ Lambert, Simon, Braukmann, Ricarda, Méndez, Eva, Sánchez, Marina, & Davidson, Joy. (2021). D3.7 Report on integration of metadata catalogues (Version 1.0 DRAFT). Zenodo. <https://doi.org/10.5281/zenodo.5744913>

4.6 Impact

As noted above, menti polls were used during the Repository Support Webinars to gauge current levels of engagement with the webinar themes and to get a sense of whether participants intended to take any concrete action in relation to what they had learned. The menti polls showed that there was a good mix of participants - with some having previously engaged with the webinar topic and many yet to engage in a practical sense. As such, the webinar series does seem to have been useful in raising awareness of a range of FAIR-enabling activities among repositories starting out on their journeys. Several participants indicated that they planned to undertake specific actions following webinar participation, such as registering their repository with FAIRsharing and/or re3data and carrying out an assessment on the FAIRness of their data holdings. Some participants suggested they would share the information they had learned with colleagues in other institutional support service areas or simply to help begin group discussions locally.

Figure 9. Menti poll on post-webinar activity from the F-UJI event



4.7 Key reusable resources

The Repository Support Webinars in the series were each recorded and have been made available via both the FAIRsFAIR website⁴⁴ and the FAIRsFAIR YouTube channel⁴⁵. The videos have also been uploaded to the FAIRsFAIR Zenodo community to support longer-term accessibility and reuse. The webinar event pages have had more than 39,000 reads combined and the video recordings on YouTube have had more than 385 views.

5. Conclusions

Drawing on the initial landscaping activities and resulting recommendations, WP3 focused on supporting the development and enhancement of FAIR-aligned data policies and on guiding the uptake of FAIR data practices among both research communities and repository service providers. To this end, we developed and delivered a wide range of support activities and resources to help support change in the short and longer-term. During the last year of the project, we delivered:

- 4 Policy Support Workshops
- 9 Repository Support Webinars
- 3 Metadata Catalogue Integration Workshops
- FAIR Data Policy Checklist to help policy makers self-assess their alignment with FAIR
- Guidance for organisations to assess 7 areas of capability maturity and engagement with FAIR-enabling practice
- Implementation Stories providing 20 real-life examples and inspiration for FAIR-enabling practices

Our Policy Support Programme helped a cohort of 20 policy makers at the RPO, funding body and national levels to better align their existing and emerging policies with the FAIR Principles. Our FAIR Data Policy checklist will enable other policy makers to assess their own policies and consider implementing our practical recommendations.

The ACME-FAIR capability framework, developed in cooperation with Science Europe, will help Research Producing Organisations to self-assess the current maturity of their capabilities for FAIR data stewardship and to actively plan for improvement over time. Our related collection of

⁴⁴ <https://fairsfair.eu/events/webinars/repository-support-webinars>

⁴⁵ <https://www.youtube.com/channel/UCe4wSBnNIBfu6SqlBalmfNg>

Implementation Stories provides concrete examples and inspiration for putting FAIR into practice.

The advice and guidance shared through our Repository Support Webinar series has helped repositories in Europe and beyond to become more familiar with concrete actions they can take to help them progress on their journey towards becoming more FAIR-enabling.

Many of the resources have value beyond the life of the FAIRSF AIR project - particularly the ACME-FAIR framework, our collection of Implementation Stories and our FAIR Data Policy Checklist. Sustainability planning for these outputs has been addressed in parallel with their development and is outlined in D1.6 FAIRSF AIR Sustainability Plan. A key priority in the final month of the FAIRSF AIR project and beyond the life of the project will be to continue to promote these outputs to additional communities. An emphasis will be placed on promoting the outputs to the tranche of newly funded Horizon Europe INFRAEOSC projects to ensure that these are considered for reuse, can be built upon and improved through their future work.

Annex 1. Table of WP3 resources

This table provides an overview of the deliverables and resources developed by WP3.

Title	Description
D3.1 FAIR Policy Landscape Analysis ⁴⁶	An analysis of the data policy landscape at various levels (national, funder, publisher, institutional) in 2019 and identification of policy elements that support or hinder FAIR data practice.
D3.2 FAIR Data Practice Analysis ⁴⁷	An analysis of practices to support FAIR data production within a broad selection of research disciplines and research data repositories.
D3.3 Policy Enhancement Recommendations ⁴⁸	A series of practical recommendations for policy enhancement to support the realisation of a FAIR ecosystem based on the initial landscape analysis.
D3.4 Recommendations on practice to support FAIR data principles ⁴⁹	Building upon an analysis of the research data practice landscape in 2019, this series of recommendations outlines practice-related actions to support the realisation of a FAIR ecosystem.
D3.5 Description of FAIRsFAIR's Transition Support Programme for Repositories ⁵⁰	This document provides recommendations to help repositories plan to become more FAIR-enabling and points to related FAIRsFAIR and support activities.
D3.6 Proposal on integration of metadata catalogues to support cross-disciplinary FAIR uptake ⁵¹	This deliverable provides an analysis of the (meta)data catalogues concept in different domain-specific research data infrastructures and research data repositories and describes a

⁴⁶ <https://doi.org/10.5281/zenodo.3558172>

⁴⁷ <https://doi.org/10.5281/zenodo.3581352>

⁴⁸ <https://doi.org/10.5281/zenodo.3686900>

⁴⁹ <https://doi.org/10.5281/zenodo.3924131>

⁵⁰ <https://doi.org/10.5281/zenodo.4058339>

⁵¹ <https://doi.org/10.5281/zenodo.4134787>

	possible pilot for metadata catalogue integration.
D3.7 Report on integration of metadata catalogues ⁵²	This report shares the findings of a small pilot based on the groundwork carried out for D3.6. The pilot explored the suitability of DCAT for metadata catalogue integration solution and some of the practical implementation challenges that should be addressed.
D3.8 Final report on policy and practice recommendations and support ⁵³	The report describes a range of WP3 support, resources and guidance developed to support our policy and practice recommendations. The report describes support for three key stakeholder groups - policy makers, research communities and repositories.
FAIR Data Policy Checklist ⁵⁴	The checklist helps policy-makers assess whether their policies are FAIR-enabling and provides practical recommendations on which aspects should be addressed in data policies to progress alignment with FAIR Principles.
Structured Policy Description Template ⁵⁵	This spreadsheet presents the list of the policy elements assessed in the FAIR Data Policy Checklist and allows policy makers to develop structured versions of their policies using a standard set of options.
Creating and Sharing Structured Policy Descriptions ⁵⁶	This guide walks users through creating a structured version of their data policy using the FAIRsFAIR policy structured description template and suggests how they can make this description accessible.
Assessing capability maturity and engagement with FAIR-enabling	ACME-FAIR is an assessment framework that helps Data Stewards and related professional

⁵² <https://doi.org/10.5281/zenodo.5744912>

⁵³ <https://doi.org/10.5281/zenodo.6225525>

⁵⁴ <https://doi.org/10.5281/zenodo.6225775>

⁵⁵ <https://doi.org/10.5281/zenodo.6225938>

⁵⁶ <https://doi.org/10.5281/zenodo.6281106>

practice (ACME-FAIR) ⁵⁷	services to self-assess how they are enabling researchers, and the professional staff who support them, to put the FAIR data principles into practice.
Collection of Implementation Stories	This collection of Implementation Stories illustrate good practices in research communities and organisations to support the implementation of the FAIR principles. These practices encompass ‘FAIR-enabling’ actions as recommended in the EC Expert Group on FAIR report Turning FAIR into Reality and the FAIRsFAIR Recommendations on practice to support FAIR principles.
FAIR-Aware Additional guidance to the Science Europe DMP assessment rubric ⁵⁸	This guide extends the Science Europe DMP evaluation rubric to include FAIR-explicit guidance which has been drawn from the FAIR-Aware tool.
Repository Support Webinar Series ⁵⁹	This series of nine webinars aimed to help repository managers become familiar with FAIR-enabling practices. Each webinar provided an overview of a specific FAIR-enabling activity, shared information on recent developments within FAIRsFAIR and other initiatives as well as offering examples of good practice, practical tips and recommendations. Recordings and presentations for all of the webinars are made publicly available.

⁵⁷ <http://zenodo.org/communities/acme-fair>

⁵⁸ <https://doi.org/10.5281/zenodo.6088214>

⁵⁹ <https://fairsfair.eu/events/webinars/repository-support-webinars>

Annex 2. Policy Enhancement Support Review Template

Policy Enhancement Support Review - [add title of policy here]

Thank you for sharing your policy with us for the FAIRsFAIR policy support programme. Over the summer, the FAIRsFAIR team carried out a review of each policy against our set of policy enhancement recommendations⁶⁰. The review process involved characterising each policy against a set of defined policy elements. The policy elements were grouped under three categories which included:

- Context of the policy such as the title and the year the policy came into effect
- Content of the policy focusing on the suggested and required aspects of RDM and data sharing
- Support for adhering with the policy and compliance monitoring

At least two reviewers assessed each policy to provide a consensus view. In this short report, we provide a brief summary outlining our characterisation of your policy and offering some general recommendations for good practice.

⁶⁰ Davidson, Joy, Grootveld, Marjan, Whyte, Angus, Herterich, Patricia, Engelhardt, Claudia, Stoy, Lennart, & Proudman, Vanessa. (2020). D3.3 Policy Enhancement Recommendations (1.0). Zenodo. <https://doi.org/10.5281/zenodo.5362183>

Context of the Policy

This section characterised details about the context of the policies themselves such as the title, year of introduction and associated persistent identifiers.

Policy element	Review Finding (choose one statement as appropriate and delete the others)	Good practice recommendation
Title	<p>The policy has a clear title and an appropriate title.</p> <p>The title of the policy would benefit from being made more explicit.</p> <p>The policy does not have a title.</p>	To support findability, policies should have a title that makes clear whose policy it is and what the policy relates to.
Year the policy was introduced	<p>The policy clearly states when it came into effect and provides a scheduled review date.</p> <p>The policy clearly states when it came into effect but does not provide a scheduled review date.</p> <p>The policy does not make clear when it came into effect or provide a scheduled review date.</p>	To support both human interpretation and machine actionability, the policy should make clear the period of validity, differentiating between the date it was written and the date it was implemented where necessary.
Persistent Identifier (PIDs)	<p>The policy has a persistent identifier such as a DOI.</p> <p>The policy does not have a persistent identifier such as a DOI.</p>	PIDs should be assigned to clearly versioned and registered policies to ensure that the right version can be found and fed into machine actionable pipelines. These PIDs should be included in the related metadata record for the policy in registries such as FAIRsharing.org or similar.
Machine readable	The policy is available in a	Policies should be described

	<p>machine readable format (e.g., HTML, PDF).</p> <p>The policy is available in a structured machine readable format.</p> <p>The policy is not available in a machine readable format.</p>	<p>consistently using a structured data markup schema to support both human and machine readability.</p>
<p>Free text to add a summary of relevant feedback provided by the reviewers on the elements in the Context section from the reviews (2-3 sentences max).</p>		

Content of the Policy

This section focused on characterising the scope and the content of the policies.

Policy element	Review Finding (choose one statement as appropriate and delete the others)	Good practice recommendation
Scope	<p>The policy makes clear the range of outputs that are covered and which are not in scope.</p> <p>The policy lacks clarity on which research outputs are covered.</p>	<p>The policy should provide a clear definition on the range of outputs that are covered by the policy such as publications, research data and software.</p>
Definition of research data	<p>The policy provides a clear definition of what is meant by the term research data.</p> <p>The policy lacks clarity over what is meant by the term research data.</p>	<p>The policy should provide a clear definition of what is meant by the term research data which can cover a very broad range of output types.</p>

<p>Data sharing</p>	<p>The policy clearly states what is expected of researchers when it comes to sharing research data and provides clarity on legitimate exceptions to data sharing.</p> <p>The policy clearly states what is expected of researchers when it comes to sharing research data but does not provide clarity on legitimate exceptions to data sharing.</p> <p>The policy lacks clarity over what is expected of researchers when it comes to sharing research data.</p>	<p>The policy should make clear any expectations around data sharing. An emphasis should be placed on making clear whether data sharing is required or is suggested.</p> <p>Where data sharing is required, the policy should provide clarity on whether compliance will be monitored.</p> <p>The policy should also make clear which legitimate exceptions to data sharing are allowed (e.g., personal sensitive, commercial sensitivity).</p> <p>Any embargo periods that are allowed should be clearly stated in the policy.</p>
<p>FAIR (Findable, Accessible, Interoperable, Reusable) Principles</p>	<p>The policy makes explicit reference to the FAIR Principles.</p> <p>The policy does not specifically refer to the FAIR Principles but aligns with FAIR.</p> <p>The policy does not address the FAIR Principles explicitly or implicitly.</p>	<p>Policies should align with the FAIR principles to lead to the production and reuse of FAIR research outputs. Whether the FAIR Principles are referred to explicitly or implicitly is less important than whether the practical actions relating to FAIR are clearly outlined in the policy. Related policy should provide some advice on selecting which data to make and keep FAIR as well as advising on where data should be deposited (e.g., trusted digital repository, institutional repository, domain specific repository).</p>
<p>Metadata sharing</p>	<p>The policy clearly states what is expected of researchers when it comes to sharing metadata.</p>	<p>The policy should make clear any expectations around metadata sharing in particular when the data themselves cannot be shared</p>

	<p>The policy lacks clarity over what is expected of researchers when it comes to sharing metadata.</p>	<p>openly. An emphasis should be placed on making clear whether metadata sharing is required or is suggested. Where metadata sharing is required, the policy should provide clarity on whether compliance will be monitored.</p>
Data Management Plan (DMP)	<p>The policy makes clear whether a data management plan should be developed.</p> <p>The policy does not clearly state whether a data management plan should be developed.</p>	<p>Policies should provide clarity over whether there is an expectation for researchers to develop a DMP as part of their research.</p>
Timing of DMP	<p>The policy makes clear at what stage the DMP should be prepared.</p> <p>The policy lacks clarity about when the DMP should be prepared.</p> <p>Not applicable.</p>	<p>Where DMPs are required, policies should provide clarity over the timing of their preparation and delivery (pre award, in award, post award). If multiple versions are required at different stages, this should be made clear.</p>
Updating of DMP	<p>The policy makes clear that the DMP should be updated at specific points over the life of the project.</p> <p>The policy makes clear that the DMP should be updated but does not specify at which points over the life of the project.</p> <p>The policy lacks clarity about whether the DMP should be updated.</p> <p>Not applicable.</p>	<p>It is advisable that the policy includes an expectation that DMPs will be updated over the research lifecycle.</p>

<p>Data Protection</p>	<p>The policy makes clear reference to data protection as part of research data management.</p> <p>The policy does not explicitly make reference to data protection as part of research data management.</p>	<p>Policies should make clear any expectations associated with data protection legislation such as GDPR or similar.</p>
<p>Research integrity</p>	<p>The policy makes reference to research integrity as part of research data management.</p> <p>The policy does not clearly reference research integrity as part of research data management.</p>	<p>It is advisable that policies and/or related guidance emphasise that data management planning and sharing data supports research integrity goals, enhances data quality and contributes to reproducibility and transparency.</p>
<p>Reference to specific standards</p>	<p>The policy makes clear if any standards or protocols should be followed.</p> <p>The policy lacks clarity about domain specific standards or protocols that should be followed.</p>	<p>Policies should make clear any expectations in relation to generic and/or domain specific standards or protocols that researchers are expected to adopt during their research.</p>
<p>Repositories</p>	<p>The policy recommends using trusted digital repositories and provides a list of specific data repositories or scientific databases for deposit.</p> <p>The policy recommends using trusted digital repositories but does not specify particular repositories or databases for deposit.</p> <p>The policy lacks clarity on the use of trusted digital repositories that</p>	<p>Policies should provide clarity about where research outputs should be deposited. We recommend specifying the use of trusted digital repositories and, wherever possible, providing a list of repository options that researchers should use in related guidance.</p>

	should be used of rdata deposit.	
Data Availability Statement	<p>The policy makes clear that a Data Availability Statement is required.</p> <p>The policy makes clear that a Data Availability Statement is encouraged.</p> <p>The policy lacks clarity on whether a Data Availability Statement is required or encouraged.</p>	<p>Policies should make clear that Data Accessibility Statements are provided in publications indicating how to access the underlying data or to request legitimate access to closed data.</p> <p>Conditions for access should also be made clear in the metadata records of the deposited dataset. Policies should require tombstone metadata records be maintained after the data may no longer be available to avoid dead ends (e.g., data is destroyed after a retention period).</p>
Intellectual Property (IP)	<p>The policy addresses IP.</p> <p>The policy lacks clarity over IP.</p>	<p>Policies should refer to IP and require the use of licences when sharing data to make clear what reuse conditions (if any) must be respected.</p>
Licenses	<p>The policy makes a clear recommendation of license types that should be used when sharing outputs (e.g., CC-BY).</p> <p>The policy lacks clarity over recommended license types that should be used when sharing data (e.g., CC-BY)</p>	<p>Policies should require the use of licences including waivers when sharing data to make clear what reuse conditions (if any) must be respected.</p> <p>Related policy guidance should help researchers to select appropriate licenses.</p>
Data Citation	<p>The policy provides a clear expectation about data citation.</p> <p>The policy lacks clarity in relation to expectations around data</p>	<p>Policies should include a clear statement in relation to expectations. Related guidance should provide advice on how to cite a broader range of research</p>

	citation.	outputs including data and software, as well as actors and enablers such as data managers, data stewards, funding bodies, research infrastructures and organisations.
Researcher Identifiers	<p>The policy provides clarity over any requirements relating to the use of researcher identifiers (e.g., ORCID).</p> <p>The policy lacks clarity over any requirements relating to the use of researcher identifiers (e.g., ORCID).</p>	<p>The use of researcher identifiers should be encouraged to support the overall FAIRness of data outputs by enabling them to be linked unambiguously to a specific researcher. The use of researcher identifiers will support emerging technologies such as Research Graphs.</p>
Preservation	<p>The policy clearly states the length of time selected outputs should be available for beyond the life of the project.</p> <p>The policy lacks clarity in relation to the length of time selected outputs should be available for beyond the life of the project.</p>	<p>The policy should make clear the period of time beyond the life of the project that they expect that selected outputs be retained.</p> <p>Guidance should be provided to assist researchers to assess the potential risks, benefits and associated costs to enable the sharing of FAIR data over time as they draft their DMP.</p>
<p>Free text to add a summary of relevant feedback provided by the reviewers on the elements in the Content section from the reviews (2-3 sentences max).</p>		

Support for the Policy

This section characterised details about the support provided to enable researchers to adhere with the policies.

Policy element	Finding (choose one statement as appropriate and delete the others)	Good practice recommendation
Costs	<p>The policy makes clear that justified costs associated with RDM and making data FAIR will be supported.</p> <p>The policy lacks clarity over whether justified costs associated with RDM and making data FAIR will be supported.</p>	<p>The policy should make clear whether justified costs associated with RDM and making data FAIR are eligible for support. Related guidance should encourage researchers and support staff to collectively identify relevant costs that should be requested in grant applications through the development of a data management plan.</p>
Guidance	<p>Associated guidance is provided to help researchers to adhere with the policy.</p> <p>It is not clear whether associated guidance is provided to help researchers adhere with the policy.</p>	<p>Policymakers should provide access to generic guidance to help researchers to comply with their policies. Where relevant and where resources allow, policymakers should provide access to domain specific guidance.</p>
Monitoring	<p>The policy makes clear that compliance will be monitored.</p> <p>The policy lacks clarity over whether compliance will be monitored.</p>	<p>Policies should make clear how and when compliance will be monitored.</p> <p>If monitoring will take place, rewards for compliance and/or penalties for non-compliance should be made clear.</p>
<p>Free text to add a summary of relevant feedback provided by the reviewers on the elements in the Support section from the reviews (2-3 sentences max).</p>		

Review Summary

[Reiterate key messages from the free text summaries out here]

We would be grateful if you would review our assessment and alert us to any elements that you feel are incorrect.

Thank you for taking part in the FAIRsFAIR Policy Support Programme!

Annex 3. Testing Assessing Capability Maturity and Engagement with FAIR-enabling Practices (ACME-FAIR)

Mari Elisa Kuusniemi (MEK), University of Helsinki

Testing the part: Defining the policy environment

Background

The data policy of university is updated recently. It was officially updated by a group of senior academics. An expert group provided the material, formulated text and vocabulary for the official working group. The group testing the ACME tool was an expert group which has just been part of updating a data policy for University of Helsinki and is now starting to create a roadmap and decides the main steps to reach the goal of data policy.

Group

- Group of 5 people
- One person from IT department, new with FAIR
- One person from business collaboration services, new with FAIR
- Two people from research office, know FAIR principles very well on theoretical level
- MEK, library, research services, know FAIR principles very well on theoretical level and have some practical experience helping data repositories on FAIRification

Method

- We had 90 min workshop.
- The only information participants got beforehand, was that we will evaluate somehow the new data policy.
- MEK picked up and mark with green colour the questions to go thought first, and yellow those to go through, if there was some time left.

- MEK prepared the result table
- At the beginning of the workshop, we watched a video just to remind us of what FAIR means: <https://youtu.be/K-kEvfaUJdA>
- Then MEK explained how the tool works. (About 2 min explanation.)
- We read by ourselves the first green row and decided on which level the new policy and Univ Helsinki is.
- Then we told others what we were decided and why. (Results on appendix.)
- In the end we decided our commonly agreed score and moved to the next green row.
- Results
- You need to discuss about the situation we are assessing: the actual present situation or situation you predict is the near future. Some of the participants tend to see the plans already turned to reality, and others want to realistically talk the current situation.
 - We decided to talk about the current situation.
- We had good timing. The result of the discussion can be used while creating a data poly roadmap for the University.
 - Participants mentioned several times, that discussion about the topics were important and valuable to the future work.
- The assessment, even made only for ourselves, effected so that participants wanted to defend their opinions. Therefore, discussion was lively. Some of us wanted badly to get higher scores, others wanted to show how low we are.
- During the discussion, we realised how much we assumed about the work of other units. We don't know the real situation, or gaps between the service units. Discussion revealed some of the gaps and misunderstandings. Like, library do not actually help with metadata standards (it only recommends using standard).
- The group had common understanding, that FAIR needs to be goal for the university. It is currently in the data policy. However, the discussion show us that the goal is not easy to reach.
- We had small group and 90 minutes workshop. We spend only short time for introduction. We managed to go through only 4 rows. It was good that most interesting ones were picked beforehand.

- The person who is responsible of coordination of the roadmap, decided to use discussion results and the other rows (which we did not have time to go through) as a background material in roadmap work.
- Overall the content was seen as useful information setting the goal for FAIR enabling services.

Testing: Workshop for Data Support network

Background

The Data Support network is a network of data management related support personnel. Network is open, and anyone interested can join. It is network of experts which includes people from IT, law, grant office, library, research office, etc.

The Data Support network has 5-7 workshops/year. There are two coordinators of the network, one from IT and one from the library. At the university data management support is given under brand Data Support, and training and guidance is created in close cooperation with several service units. If we want to develop new processes or services, we in most cases first discuss about ideas in the workshops of Data Support network.

Group

- Group of 20 people, but only 16 of them participated to the groupwork
- Heterogenic backgrounds (IT, library, research office)

Method

- We had 3 meetings organising the workshop. We needed to convince the network coordinators about the usefulness of the testing the tool and how FAIRenabling our services are.
 - At first it was quite hard to get people with IT background to believe, they can discuss about the topic. They were quite doubtful.
 - We planned to choose the topics (rows) from the toll together, but there was some difficulties (link did not work at first, etc.). In the end MEK did pick topics and others agreed to use those rows. Afterwards it is quite clear that topics

picked resonated MEK, because she works now mainly with data policy, professionalising data stewardship, data curation and long-term preservation. (You can find the topics we picked from the result document attached.)

o We had meetings in which

§ we discussed about the goal of the workshop more deeply and

§ how we organised the workshop:

- who will be the facilitator
 - how many small groups
 - who will secretaries of the small groups and
 - prepared the table for result.
- Participants got the assessment tool beforehand.
 - We had 90 min workshop.
 - At the beginning we had small reminder what FAIR is (video)
 - Then Ari Asmi told us some background information about the tool.
 - We had 30min for discussion in small groups. Each gropes got two rows/topics to discuss. We had 5 groups.
 - We had 10min break
 - After the break we collected the results and discussed about the method.

Results

- We end up having a facilitator who did not know the tool or topic so well (he was from IT unit). It went quite well.
 - All groups had lively discussion.
 - It might be good to stress out more clearly, that the assessment tool does not aim to give an exact score to your services, but to facilitate discussion around the topic of FAIR enabling services.
 - Also in this workshop, we needed to remained participants to assess the current services (not future one we dream about) and assess only services we know (not the ones we assumed other units provide).
- o Discussion shows that we think we know what is the situation of other units almost better that the persons working in the unit. The discussion is a nice

reality check. The self-assessment setting facilities discussion were we automatically try to correct (nicely but firmly) misunderstandings.

- We find that loose way of giving scores is the most fruitful approach. The score categories are not always matching the situation at the university. It might happen that you have something from the third level, but not all from level one. Therefore, it is sometimes ok to give score at the form of 2-3 or even 1-3. The description why this is the case, is important, not the number.
- Even though people from IT unit were sceptical, they were surprised they could participate the discussion quite nicely.

Examples of the questions/topics raised up in the workshop (reported by secretaries of the small groups)

- 7. Ensuring all retained datasets are consistently assigned Persistent Identifiers (PIDs)” does the question refer to the metadata or to the data sets only?
 - Concerning metadata, this is easier to achieve.
 - DataCite also came up for discussion, and whether it will somehow also be used to take account of permanent identifiers.
- With regard to '8. Being responsible for data curation', it was quite unanimous that we do not have the resources for anything other than the training of researchers in general.
 - Sector-specific advice could be possible within an institution or research groups (if they include someone appointed to the position), but as a service this would require far too many resources.
 - The question also arose as to whether this side point has been mentioned in the new data policy, but no one had any recollections. [It is mentioned in the data policy!]
- Discussion on the content of our points and the evaluation tool itself, and how we understood the sentences, and the discussion clarified these.
- We also discussed the team's expertise and competence development, i.e. very grassroots issues.



- I don't think there was anything particularly difficult.
- This was a new thing, which is why it took time to internalize it.
- If, at the end of the day, we had gone through those points, I am sure that our common understanding would have increased and further clarified those sentences.
- A more detailed presentation of the instrument might have been necessary, or more information about the tool in the workshop invitation and what will be done.

