# Workshop report

### FAIR data maturity model Working Group

Online meeting #8 — 24 March 2020

Project	RDA FAIR data maturity model working group	Date & Time	24 March 2020 11:00 — 12:30 UTC 24 March 2020 08:00 — 09:30 UTC
Туре	Online meeting	Location	Google Meet
Meeting Chairs	Keith Russel Shelley Stall	Issue date	03/04/2020

# **Objectives**

The 8th workshop was organised within the context of the RDA Virtual Plenary 15 (VP 15) replacing the FAIR Data Maturity Model WG: 3rd face-to-face meeting that had been planned to take place in Melbourne. The session was designed to be as interactive as possible and tackle the most recent topics the Working Group had come across. On top of that, it was an opportunity to report back on the results of the testing phase. These results led to change requests that were presented. Finally, as the Working Group is coming to an end, it was time to start looking for options to ensure the continuity of the work carried out until now.

### Agenda

- 1. Welcome, objectives of the meeting
- 2. Roundtable
- 3. State of play
- 4. General discussion (part I) strategic to practical issues
- 5. General discussion (part II) indicators revision
- 6. Action items and next steps

#### Useful links

- RDA FAIR data maturity model WG
- RDA FAIR data maturity model WG Case Statement
- RDA FAIR data maturity model WG GitHub
- RDA FAIR data maturity model WG Collaborative document
- RDA FAIR data maturity model WG Indicators prioritisation
- RDA FAIR data maturity model WG Indicators prioritisation survey results
- RDA FAIR data maturity model WG Guidelines

- RDA FAIR data maturity model WG Mailing list
  RDA FAIR data maturity model WG Workshop #8 material
  RDA FAIR data maturity model WG Evaluation methodology

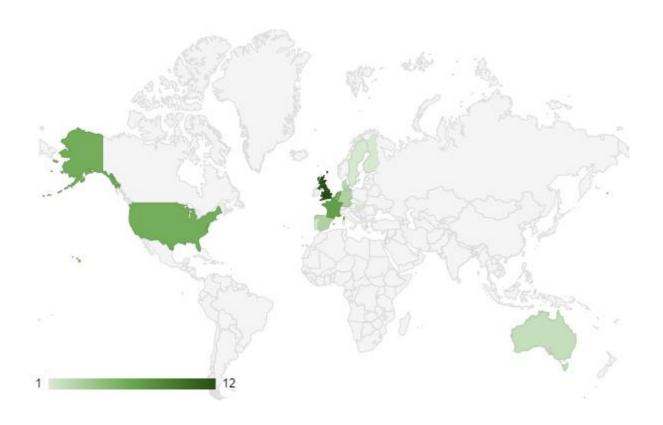
# **Participants**

The workshop was well attended. Here below is a non-exhaustive list of the participants.

Name	Country code	Affiliation	
Anders Conrad	DK	DeiC / EOSC FAIR WG	
Alicia Fátima Gómez Sánchez	ES	FECYT	
Andras Holl	HU	Library and Info Center	
Arnaud Gingold	FR	OPERAS RI	
Barbara Sierman	NL	KB National Library of the Netherlands	
Carole Goble	GB	University of Manchester	
Catherine Jones	GB	Energy Data Centre, STFC/UKRI	
Chris de Loof	BE	BELSPO	
Christophe Bahim	BE	PwC, Editor team	
Danielle Welter	LU	University of Luxembourg / FAIRplus	
Diba Terese Markus	DK	Aalborg University	
Ebtisam Alharbi	GB	PhD, University of Manchester	
Edit Herczog	BE	Chair, Vision & values SPRL	
Frances Lightsom	US	U.S. Geological Survey	
Françoise Genova	FR	Centre de Données astronomiques de Strasbou (CDS)	
Ge Peng	US	NOAA	
Gerhard Goldbeck	GB	Goldbeck Consulting	
Henriette Senst	DE	German Archaeological Institute	
Herman van Vlijmen	BE	Janssen / FAIRplus	
Ibrahim Emam	GB	Imperial Data Science Institute / FAIRplus	
Ingrid Dillo	NL	DANS, FAIRsFAIR	
Isabelle Perseil	FR INSERM		
Keith Russell	AU	Chair, ARDC	
Leighton Christiansen	US	National Transportation Library,	
Makx Dekkers	ES	Independent Consultant, Editor team	
Margareta Hellström	SE	ICOS Carbon Portal and Lund University	
Mari Elisa Kuusniemi	FI	Helsinki University Library	
Mark Parsons	US	Rensselaer Polytechnic Institute	

Mark Wilkinson	ES	GBGP, UPM – INIA	
Marta Teperek	NL	TU Delft	
Matthew Viljoen	GB	Infrastructure Operations Manager, EGI Foundation	
Mohamed Yahia	FR	Inist-CNRS	
Mustapha Mokrane	NL	DANS	
Nick Juty	GB	University of Manchester, ELIXIR-UK	
Nicolas Loozen	BE	PwC, Editor team	
Oya Beyan	DE	EOSC FAIR WG & FAIRplus CMMI	
Patricia Herterich	GB	Digital Curation Centre / University of Edinburgh	
Paula Andrea Martinez	AU	National Imaging Facility	
Pedro Principe	PT	University of Minho Portugal	
Peter McQuilton	GB	FAIRsharing / University of Oxford	
Philippe Rocca-Serra	GB	University of Oxford e-Research Centre	
Rob Hooft	NL	Dutch Techcentre for Life Sciences	
Romain David	FR	INRA	
Sandor Brockhauser	DE	EuXFEL / PaNOSC	
Shelley Stall	US	American Geophysical Union	
Simon Lambert	GB	UKRI-STFC / H2020 FREYA	
Sophie Aubin	FR	INRA	
Sophie Hou	US	U.S. Geological Survey	
Susanna-Assunta Sansone	GB	University of Oxford	
Wouter Addink	NL	Naturalis Biodiversity Center	
Yannick Hoarau	FR	UNISTRA	

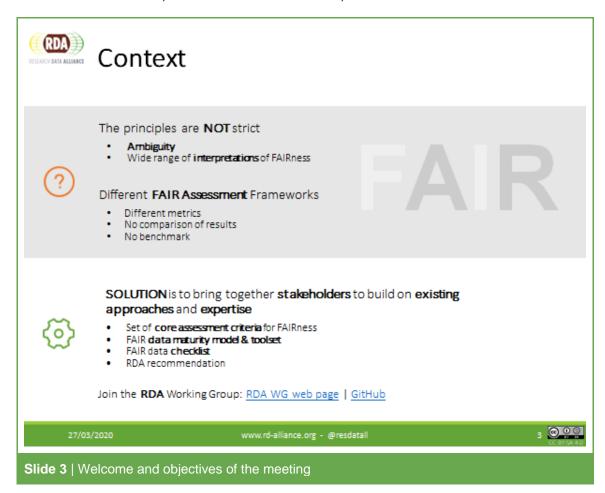
Here below is a map representing the provenance of the different participants



## Content<sup>1</sup>

The workshop was designed to be as interactive as possible: interaction was encouraged when presenting i) the general issues (from strategic to practical perspective) and ii) proposed resolutions (i.e. revision of indicators). The editorial team and the participants went one by one over the issues discussing the different viewpoints. As a result, the meeting was fruitful and enabled lively discussions. The major issues discussed and the comments from the members of the Working Group can be found later in this document.

- 1. The Chairs opened the workshop, welcomed the participants and addressed the agenda. The approach to the Working Group was again presented:
  - Challenges rising from the different interpretations of FAIRness
  - Bringing together the relevant stakeholders to discuss and build on existing expertise and different approaches
  - Intended results: i) set of core assessment criteria for FAIRness ii) FAIR data maturity model & toolset iii) RDA recommendation and iv) FAIR data checklist.

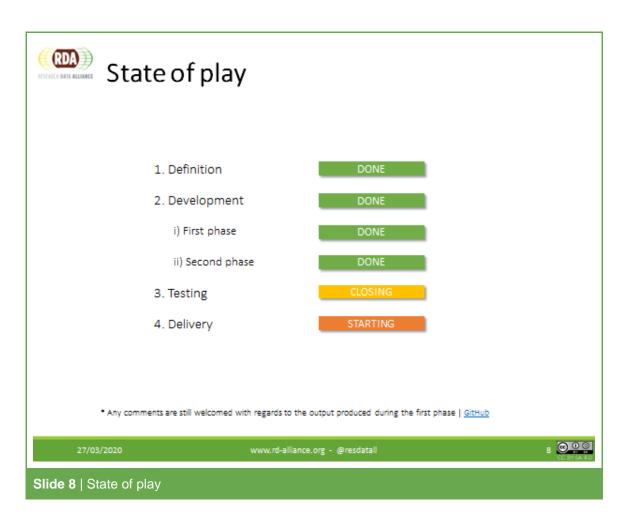


<sup>&</sup>lt;sup>1</sup> Please note that some of the slides are displayed for information purposes. The full presentation can be accessed via the RDA FAIR data maturity model WG web page.

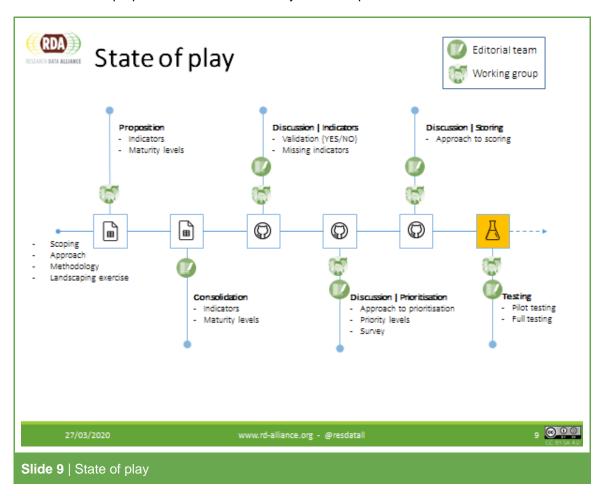
As usual, the Chairs insisted that despite all the challenges arising when designing indicators, the purpose of the WG was **NOT** to re-design the FAIR principles. As there are currently different interpretations of what the FAIR principles entail, the primordial goal is to build a common understanding.

In addition, the chairs reminded that all the presentations and reports are on the RDA FAIR data maturity model WG web page and the members are encouraged to participate via the dedicated GitHub repository.

- 2. The Chairs and the editor team introduced themselves, following, the participants were kindly invited to say where they come from and what are their roles in their organisation via the chat window.
- 3. The editorial team reported on the current state of development: what steps have been taken and what steps remain to be taken.



As illustrated on the slide above, the editorial team reminded participants that, at the outset of the working group, a methodology was designed. The methodology is composed of four main phases. In the beginning of 2020, the editorial team rolled out the testing phase. The testing phase closed at the end of March. All results were analysed and transformed into change requests, which have been put forward to the WG on the dedicated <a href="GitHub">GitHub</a>. Unless otherwise agreed, these proposed changes will be made in early April 2020. Finally, the delivery phase has been started and the editorial team will prepare the FAIR data maturity model outputs for a RDA recommendation.



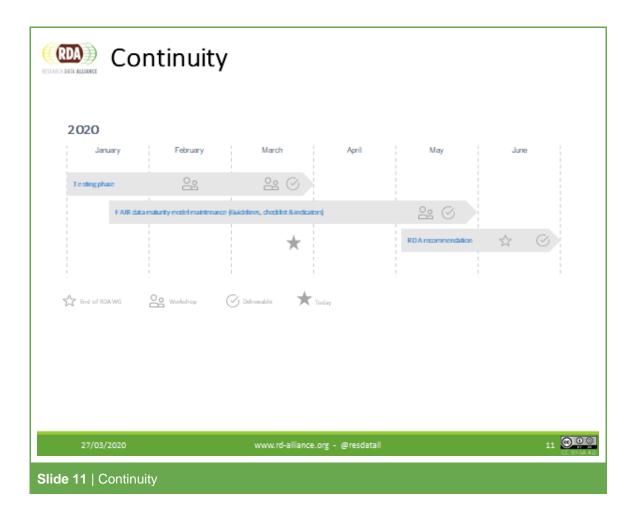
As illustrated by the slide above, the Working Group was first invited to propose potential indicators to measure the FAIRness of a digital resource. The editorial team then consolidated all the contributions, which resulted in a set of 51 indicators.

That consolidated set was shared for comments on the dedicated GitHub. Additionally, the editorial team made proposals for prioritisation and scoring. Discussions related to these three topics (i.e. indicators, prioritisation and scoring) were happening in parallel on the GitHub.

In order to facilitate the consensus process about prioritisation, the editorial team put together a survey. Based on the outcome of the survey, the priorities were frozen and further discussion was postponed to after the testing phase.

At the end of 2019, the editorial team initiated a pilot for testing the indicators. The feedback collected in the pilot testing phase allowed to better structure the full testing phase. This full testing phase was set to run from January until mid-March. Results from the testing phase were analysed, discussed with the WG and will now – unless otherwise agreed – be integrated into the FAIR data maturity model.

The editorial team further investigated ways to score the FAIRness of a digital resource and is currently in the process of finalising the outputs produced by the Working Group (i.e. prepare the RDA recommendation).



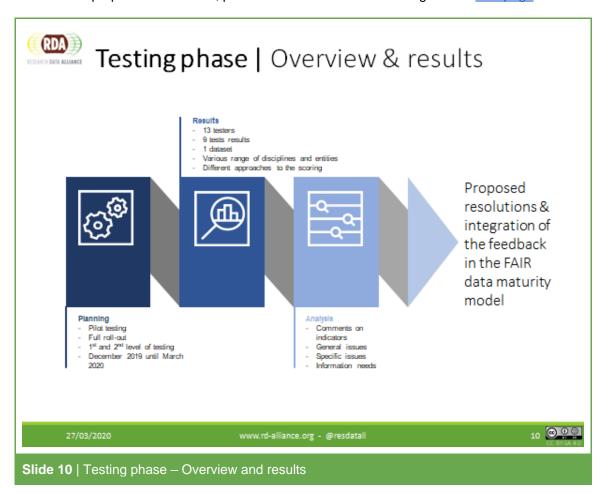
The editorial team touched upon the planning of 2020. Three work streams have been identified.

- 1. Testing phase which is now closed. The final results and conclusions can be found here.
- FAIR data maturity model maintenance update of the guidelines and proposal for a checklist based on continuous feedback during the testing phase. A stable version of the guidelines will be shared for public review in mid-April.

3. RDA Recommendation – the editorial team will work to submit the deliverables for publication as an RDA recommendation; this proposed Recommendation will be presented during our last workshop at the end of May.

The editorial team walked the participants through the high-level testing phase timeline. The main take-away is that the feedback was analysed and transformed into resolution propositions and will be integrated soon into the FAIR data maturity model.

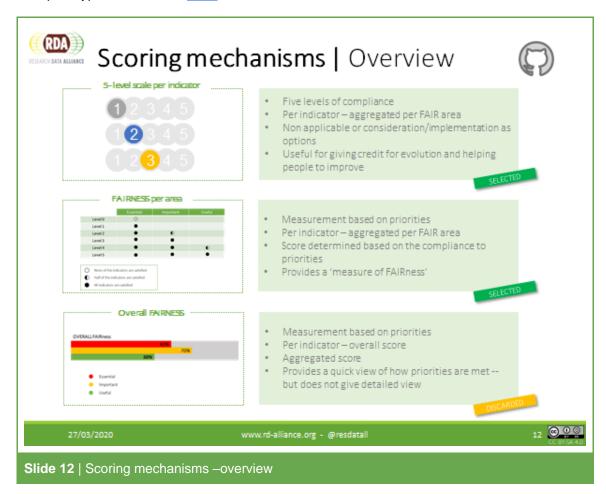
To review the proposed resolutions, please have a look at the following GitHub web page.

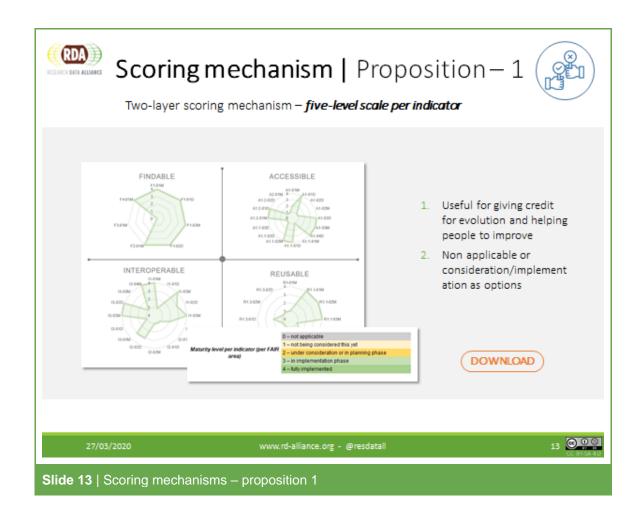


In 2019, the editorial team proposed a first method to score the indicators. Ever since, discussions (during <u>workshops</u> and <u>offline</u>) and the early testing phase have shaped that first proposal. Two additional proposals have arisen. These three approaches towards scoring the indicators were discussed with the WG to determine the way forward. As suggested by the members of the WG, the third approach, which was to assign an overall FAIRness score, was dropped.

The editorial team then proposed a two-layer evaluation method, with one layer evaluating the maturity of each indicator on a five-level scale and one layer providing a binary evaluation of the evaluator with a summary per FAIR area. The five-level scale per indicator gives information on how far along the journey toward FAIRness a resource under evaluation is for a particular indicator, while the binary evaluation gives an indication on the overall performance of the evaluated resource

against the FAIR areas at a given time. Further information about the two-layer evaluation method and a prototype can be found <u>here.</u>





This approach is focused on the extent to which a resource under evaluation meets the requirement of the indicator, in order to answer the question: "How can the FAIRness of this data be improved?"

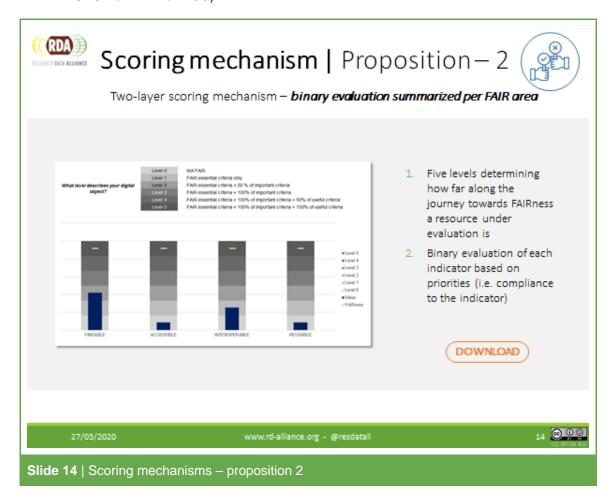
The indicator maturity levels are defined as follows:

- 0 not applicable
- 1 not being considered this yet
- 2 under consideration or in planning phase
- 3 in implementation phase
- 4 fully implemented

The FAIRness progress per indicator is an evaluation of each indicator against these five levels of compliance. It gives the possibility to 'discard an indicator' as it might not be relevant for a particular community. The rationale of this approach is to give credit for evolution and help people to improve.

Here below are some key takeaways – views from the audience – from the discussion:

 Radar plots only make sense if the connections between adjacent indicators actually make sense, yet the purpose of the WG is to have independent indicators. • Could level one be 'useful criteria' ? – should they be easy to implement (as chosen in WCAG from WAI of W3C).

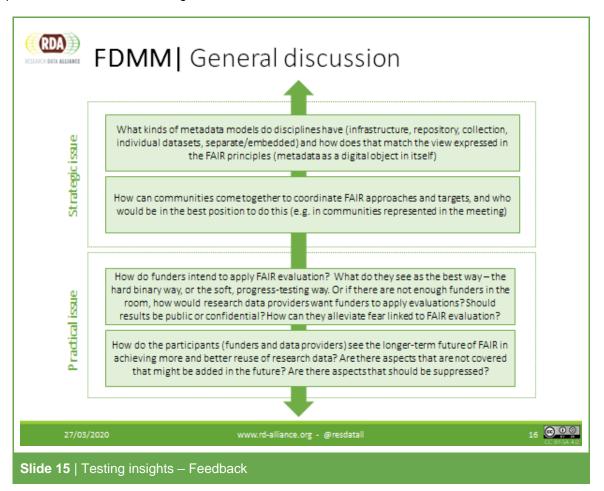


This approach is focused on determining how a resource under evaluation performs on meeting the indicators across the FAIR areas. In that sense, it is a stricter evaluation as it gives a binary answer on each of the indicators, in effect only counting the indicators that reach top level 4 in the approach that measures progress in the previous slide.

In addition to measuring the passing or failing on individual indicators, this approach measures the FAIRness per area by taking into account the priorities. It is measured per indicator – and aggregated per FAIR area. The level per area is determined based on the compliance to priorities. This is used to provide a 'measure of FAIRness'.

	Mandatory	Recommended	Optional
Level 0	0		
Level 1	•		
Level 2	•	•	
Level 3	•	•	
Level 4	•	•	•
Level 5	•	•	•

**4.** As outlined in the introduction, a general discussion was foreseen. Four issues we presented and debated at length.



Here below is a non-exhaustive list of observations and comments made by the participants for each of the issues.

#### Strategic issue

What kinds of metadata models do disciplines have (infrastructure, repository, collection, individual datasets, separate/embedded) and how does that match the view expressed in the FAIR principles (metadata as a digital object in itself)

- The wording 'model' may be confusing. 'Metadata elements' could be more appropriate than 'model'.
- There are several levels of metadata: collection level (i.e. information that is the same across a group of data resources or for a repository) and at the individual level (i.e. dataset level).
- Developments to improve domain-specific metadata in generic platforms / repositories should be made possible. Indexability of metadata must be defined and should permit exchange of metadata between repositories.
- Metadata embedded in the data ensures that metadata and data are kept together in data exchange. Nevertheless, not all metadata can be embedded because there are aspects that cannot be known when the data is created, for example relationships, annotations, etc.
- There may be a role for landing pages in providing information, but they are mainly useful
  for human consumption. If there were standards for the layout of landing pages, they could
  be made interoperable for machines, but no such standards exist.
- It would be useful if there was one standard for discovery and schema.org was mentioned
   but content-related metadata will always need discipline-dependent standards.
- One should also consider that the standards evolve over time.
- Another challenge is the use of different vocabularies. This makes interpretation of the metadata difficult.
- To some participants, it is less about the data model than the practices. For instance, associating metadata to a persistent identifier is becoming a norm.
- A specific challenge was identified in the way that metadata can be harvested. There is currently no agreed way to publish metadata in such a way that harvesters know where to find it. It would most likely not be possible to agree on a single approach, but it would be useful if some patterns could be agreed for the publication, maybe similar to the way that robots.txt provide information for web harvesting.
- Exchange of metadata between repositories would be a leap forward. Yet domain repositories are preferred rather than generic repositories.
- Pointers to metadata are useful. In the event of countries restricting data leaving the country, 'FAIR pointers' will be critical for cross-border exchange of data.

#### Strategic issue

How can communities come together to coordinate FAIR approaches and targets, and who would be in the best position to do this (e.g. in communities represented in the meeting)

- Repositories that are used to deposit data can help ensure that the data is FAIR. As a
  result, several communities have well defined and accepted metadata models and formats
   implemented by these repositories.
- It is quite important to ensure that the focus is not only on domain repositories, but also on institutional data repositories – and other hybrid repositories (e.g. Zenodo) – as they play an important part in ensuring FAIRness.
- Different communities have different expectations of FAIRness, and there is the factor that some of this is designed by informatics, not by the research community. It is not clear what the incentive for researchers is to support such coordination
- Awareness at the policy levels is needed to help communities come together.
  - USGS and the American Geophysical Union agreed to the FGDC standard. They
    are also developing policies for metadata and building a federal index. For that
    purpose, they are currently following up on the FAIR Data Maturity Model
    indicators.
  - GO-FAIR is looking at overlaps across communities.
  - The Belgian national archives are involved in ESFRI social data that harvests metadata from funded projects.
  - The work of EOSC Digital Objects aims to achieve a thin layer of interoperability.
  - NOAA issued recommendations in 2015 to improve collection metadata with core profiles to describe what, where, the provenance and quality.
  - There is a strong need to look across communities to see what the common metadata models are. This exercise is currently carried out by FAIRsFAIR and the result translates into <a href="https://fairsharing.org/">https://fairsharing.org/</a>. They are doing an inventory of what the communities are doing in practice.

#### **Practical issue**

How do funders intend to apply FAIR evaluation? What do they see as the best way – the hard binary way, or the soft, progress-testing way. Or if there are not enough funders in the room, how would research data providers want funders to apply evaluations? Should results be public or confidential? How can they alleviate fear linked to FAIR evaluation?

• Evaluation methods might not be useful from the repository point of view; tools that test FAIRness of data are not able to test FAIRness aspects of repositories.

- Some funders with external assistance are looking at data stewardship from a different perspective. They are trying to determine how FAIR the data will be if the DMP proposed is executed. This acts as a pre-test that involves guidance on processes in data creation so that data becomes FAIR throughout the process.
- Evaluation methods should be used carefully as they might be easily misused by the Funders, who want an easy answer to drive their funding decisions whereas FAIRness is complex.
- Testing FAIRness does not say anything about the quality of data.

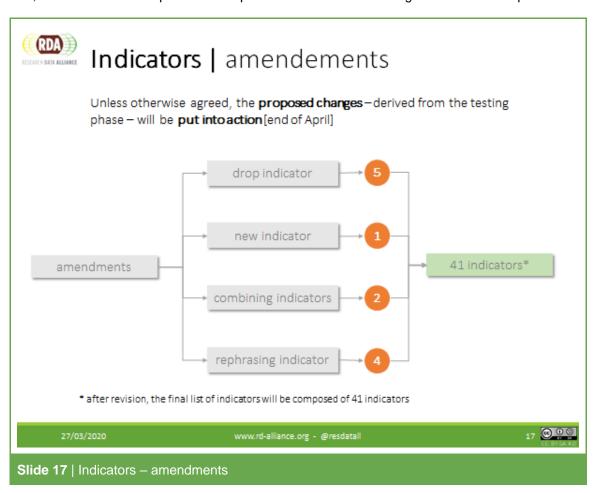
#### **Practical issue**

How do the participants (funders and data providers) see the longer-term future of FAIR in achieving more and better reuse of research data? Are there aspects that are not covered that might be added in the future? Are there aspects that should be suppressed?

- The relationship between FAIR and CARE could be further developed to allow for the human dimension of data publication and reuse.
- RDA could work on recommendations for the maintenance of FAIRness over time. Context is time dependent and prone to decay (e.g. file formats change over time)
- There is a need to consider the long-term organizational commitment to FAIR. The longer-term commitment needs to include keeping the data online, keeping the metadata available even if the data is gone, and preserving information about workflows that were used to select and process the data.

5. After the round of testing of the indicators in January and early February, as reported in the meeting of 13 February 2020, the editorial team analysed the comments from the testers and from discussions on the Guidelines. From those comments, several issues were identified and brought to the attention of the WG. Delving deeper into the feedback, the editorial team derived requests for clarifications – to be addressed in the Guidelines –, others were about the formulation of indicators, but also addition, removal or combination of indicators.

GitHub issues were created to facilitate discussion and to attempt to reach consensus by early April 2020, before the start of a public review period of the indicators and guidelines in mid-April.





Here below are some key messages – views from the audience – from the discussion:

- Some participants advised not to drop standards from vocabularies. Indeed, it is hard to be
  interoperable without following a standard. However, it was argued that the aspect of
  standards in implied in the requirement for vocabularies to be FAIR.
- Standards are important, but needs a definition. As a matter of fact, a well-defined standard is widely used.
- It was proposed by a member of the audience to tackle the standard importance in the guidelines (i.e. description section of remaining interoperable indicators) and still proceed with the suppression of the aforementioned indicators.
- "One concern is to agree on indicators but implementing indicators is dependent on everybody's discretion".

In addition to removing indicators, propositions to add, merge and rephrase indicators were made

#### **NEW INDICATOR**

1. A1-0xM: New indicator alongside A1-01D for manual access to metadata; it was pointed out that there is no indicator for manual access to metadata while there is an indicator for manual access to data (A1-01D Data can be accessed manually (i.e. with human intervention)). An argument was made that there are cases that metadata can only be accessed with human intervention.

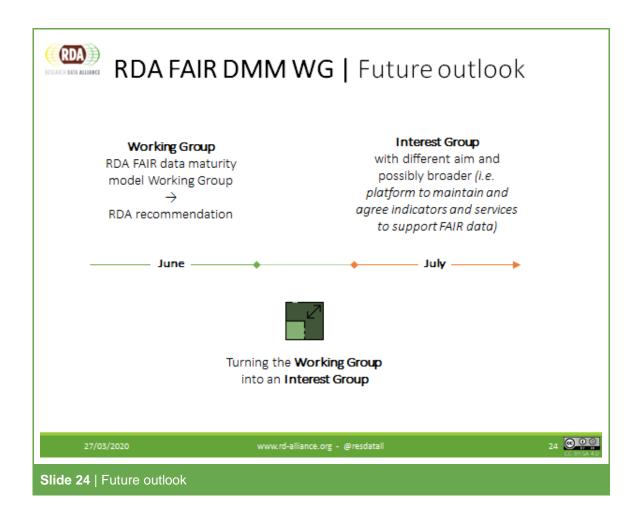
#### **COMBINING INDICATOR**

- A1-01M: Merge closely related indicators A1-01M, A1.1-03D and A1.2-01M into A1-01M
  with definition "Metadata contains information to enable the user to get access to the data";
  in guidelines include that this can be information about access control, e.g. need to register
  or provide username/password.
- 2. A1.2-01D, A1.2-02D: Merge these two: having separate indicators for authentication and authorisation puts undue emphasis on these aspects; they will always be evaluated together.

#### REPHRASING

- **1.** R1-01M: Rephrase: align with wording of principle R1; not "sufficient metadata" but "plurality of accurate and relevant attributes".
- 2. F2-01M: Rephrase: delete the mention of standard in indicator for F2 the standard aspect is covered in R1.3 the indicators in F2 and R1 will just focus on the amount of metadata, and R1.3 will test that metadata is standard.
- **3.** F1-02M+D: Rephrase: use 'globally unique' instead of 'universally unique' to align with the principle and because it might be confusing as UUID has a very specific meaning.
- **4.** I3-02D, I3-03M, I3-04M: Rephrase: drop 'sufficiently' qualified that's not in the principle, only 'qualified'

If there are no objections, the changes listed above will be put into action in early April. Should you disagree with a proposition please voice your concerns in the didacted GitHub thread or via mail at fair maturity@rda-groups.org



As the lifespan of the Working Group is almost over, the Chairs introduced the option to continue the work and asked the audience what the new structure and scope should be to best support this initiative.

Here below are some observations made by the participants:

- The Working Group can continue to exist in the form of a *maintenance Working Group* to have follow-up discussions as the RDA recommendation gets implemented (e.g. implementation use cases, roadmaps, etc.).
- 'Maintenance' is RDA terminology. In practice, the group engages with others for implementation, feedback and adoption. Maintenance of RDA outputs can also be done by an Interest Group.
- It is important to define a narrow scope. The stakeholders involved in that process should be careful not to make the IG / WG about all things FAIR-related (e.g. not overlap with the WG suitability of data for reuse). The most successful groups have a defined focus.
- Maintenance is obviously needed to avoid the guidelines and potentially other WG's outputs – decaying.

- Having ongoing support is important for adoption (i.e. feedback loop). Additionally, implementation of a recommendation is an important aspect for RDA.
- The US Geologic Survey is looking at the output of this WG for possible adoption.

## Follow-up action plan

Working Group members are invited to:

- Share feedback, comments & suggestions on the <u>Guidelines</u>
- Contribute to GitHub discussion on revising the indicators
- Contribute to GitHub discussion on scoring

As announced during the workshop, the editorial team is currently finalising (e.g. revising the indicators, addressing and closing the latest comments, etc.) the outputs and needs contribution, particularly now, to the FAIR data maturity model.

The short-term goal is to propose the guidelines for public review during the second half of April. Resulting feedback will be used to fine tune the guidelines and submit the final version to the RDA council for a RDA recommendation. The public review period is set to last 4 weeks, from mid-April to mid-May 2020. Further information will be shared in due time.

The next and last workshop will take place online and at the end of May. Lastly, the agenda and connection details will be shared soon through the usual channels.

WORKSHOP#9

20 May 2020 15.00 to 16.30 UTC 21 May 2020 07.00 to 08.30 UTC

## ANNEX I – Links shared

Below are links shared by the participants during the workshop.

- https://registry.gbif.org/
- Metadata used by the biodiversity community –
   https://registry.gbif.org/institution/3b896e03-901d-4cc7-ac2b-61e0469521b0
- Summary of Data Summit with lessons learned <a href="https://ardc.edu.au/news/challenges-collaboration-and-shared-expertise-at-the-ardc-data-summit/">https://ardc.edu.au/news/challenges-collaboration-and-shared-expertise-at-the-ardc-data-summit/</a>
- Establishing a FAIR Biomedical Data Ecosystem workshop https://www.scgcorp.com/repositories2020/regclosed
- Consortium of European Social Science Data Archives https://www.cessda.eu/
- Belgian Infrastructure for Social Sciences and Humanities Open Science <a href="https://enquetemuseum.sabuma.be/index.php/559225/lang-fr">https://enquetemuseum.sabuma.be/index.php/559225/lang-fr</a>
- INRAE data schemas <a href="https://data.inra.fr/dataverse/lovinra">https://data.inra.fr/dataverse/lovinra</a>
- http://agroportal.lirmm.fr/
- State Archives of Belgium <a href="https://dataverse.arch.be/">https://dataverse.arch.be/</a> linked to the SODA project
   <a href="https://sodabelgianproject.wixsite.com/sodaproject">https://sodabelgianproject.wixsite.com/sodaproject</a> which is a contribution to CESSDA <a href="https://www.cessda.eu/">https://www.cessda.eu/</a>
- BISHOP project (in support of CESSDA and Dariah) –
   https://www.belspo.be/belspo/openscience/openData\_en.stm

   https://www.belspo.be/belspo/openscience/doc/ORD\_Policy\_Dec2019.pdf
- FAIR in practice reference list –
   https://docs.google.com/spreadsheets/d/13MDn1I07OkXxdrBGd9SDUNcil58Pld6BvOEUkltT9a0