

Workshop report

FAIR data maturity model Working Group

Online meeting #4 - 12th September 2019

Project	RDA FAIR data maturity model working group	Date & Time	12 September 2019 07:00 — 08:30 UTC 12 September 2019 15:00 — 16:30 UTC
Type	Online meeting	Location	Online GoToMeeting
Meeting Chairs	Edit Herczog Keith Russell	Issue date	19/09/2019

Objectives

The overarching objective of the fourth workshop was to obtain the final comments about the proposed indicators and agree on the latter to thereafter determine the TO-BE *common set of core criteria*. Additionally, the workshop served to present some insights for a scoring mechanism. Finally, this workshop would give a glimpse of the approaches towards testing the common set of core criteria.

Agenda

1. Welcome, objectives of the meeting
2. Roundtable
3. State of play
4. Development | First phase (*presentation of the work conducted for approval*)
5. Development | Second phase (*presentation of an approach & discussion*)
6. Testing (*presentation of an approach & discussion*)
7. Action items and next steps

Useful links

[RDA FAIR data maturity model WG](#)
[RDA FAIR data maturity model Case Statement](#)
[Workshop #4 material \(Presentation and report\)](#)
[RDA FAIR data maturity model GitHub](#)
[RDA FAIR data maturity model Collaborative document](#)
[RDA FAIR data maturity model Indicators prioritisation](#)

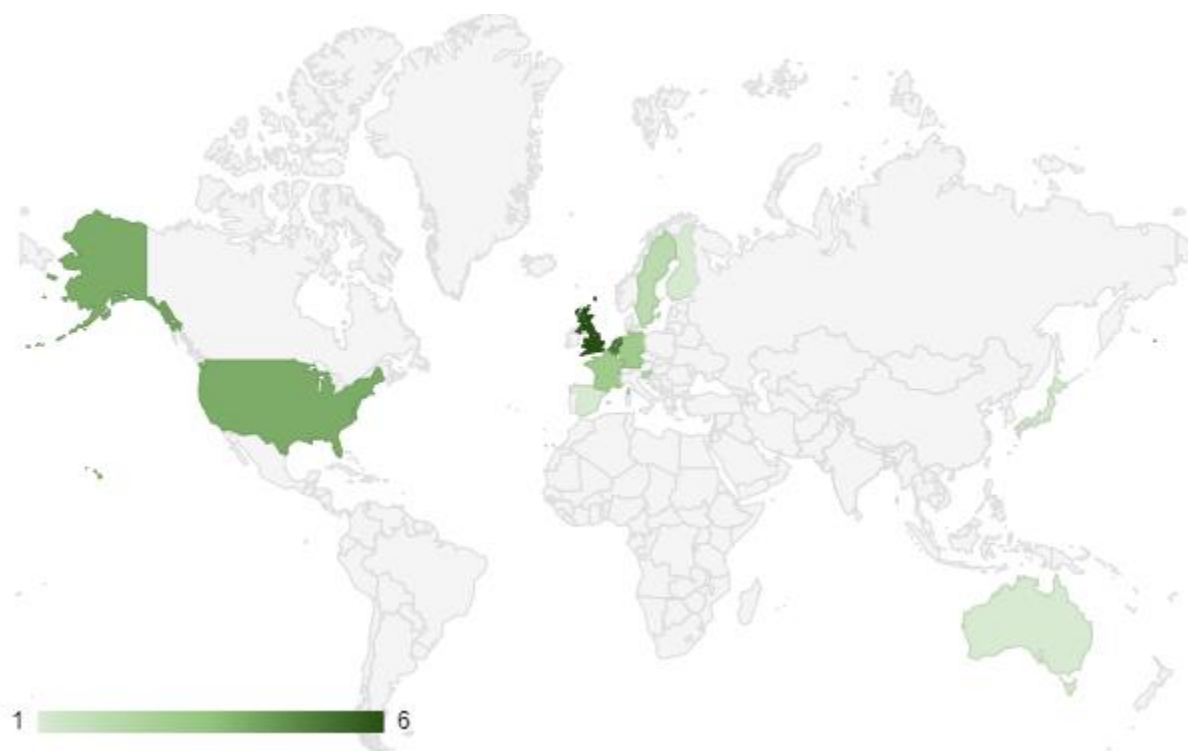
Participants

The workshop was well attended, there were 19 participants for the morning session and 20 participants attended the session in the afternoon. Below you can find the names of a number of participants that attended.

<i>Name</i>		<i>Affiliation</i>	<i>Presence</i>	
			0700 UTC	1500 UTC
Ana Slavec	SI	Researcher		•
Anusuriya Devaraju	DE	PANGAEA / University of Bremen	•	
Barbara Sierman	NL	KB National Library of the Netherlands	•	
Birger Jerlehag	SE	University of Gothenburg	•	
Carole Goble	GB	University of Manchester		•
Dimitri Szabo	FR	INRA	•	•
Edit Herczog	BE	Co-Chair, Vision & values SPRL	•	
Fiona Murphy	GB	Independent Consultant in Research Data and Publishing	•	
Florian Barthelemy	BE	PwC, Editor team	•	•
Frederic Andres	JP	National Institute of Informatics, Tokyo		•
Ge Peng	US	North Carolina State University / NCEI	•	
Hannah Calkins	US	Children's Hospital of Philadelphia		•
Ian Fore	US	CBIIT		•
Ilona von Stein	NL	DANS	•	
Jessica Parland-von Essen	FI	FAIRsFAIR WP2, CSC	•	
Julianna Pakstis	US	Children's Hospital of Philadelphia		•
Keith Russell	AU	Co-Chair, ARDC		•
Konstantinos Repanas	BE	European Commission DG RTD		•
Maggie Hellström	SE	Lund University		•
Makx Dekkers	ES	Independent Consultant, Editor team	•	•
Martina Stockhause	DE	DKRZ (German Climate Computing Center)	•	
Mohamed Yahia	FR	Inist-CNRS / Datacite	•	

Mustapha Mokrane	NL	DANS	•	
Nicolas Loozen	BE	PwC, Editor team	•	•
Oya Beyan	DE	EOSC FAIR WG & FAIRplus CMMI		•
Patricia Herterich	GB	Digital Curation Centre / University of Edinburgh		•
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		•
Ronald Cornet	NL	University of Amsterdam	•	
Simon Lambert	UK	UKRI-STFC / H2020 FREYA		•
Stebe Janez	SI	ADP (Social Science Data Archives)	•	
Susanna-Assunta Sansone	GB	University of Oxford	•	
Zsuzsanna Szeredi	BE	Vision & Values		•
			19	20
			35	

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



Content¹

The workshop was designed in order to be as interactive as possible: to do so the attendees were given the opportunity to speak up whenever necessary. Consequently, the meeting was fruitful and enabled lively discussions.

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

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Welcome, objectives of the meeting

The principles are **not strict**

- **Ambiguity**
- Wide range of **interpretations** of FAIRness

Different **FAIR Assessment** Frameworks

- Different metrics
- No comparison of results
- No benchmark

SOLUTION is to bring together **stakeholders** to build on **existing approaches** and **expertise**

- Set of **core assessment criteria** for FAIRness
- FAIR **data maturity model & toolset**
- RDA recommendation
- FAIR data **checklist**

NOT re-design
the FAIR Principles

Join the **RDA** Working Group: [RDA WG web page](#) | [GitHub](#)

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Slide 3 | Welcome and objectives of the meeting

¹ 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.

This time, 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 primary 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. After that, the participants were kindly invited to say where they are from and what their roles are in their organisation via the chat window.
3. The editorial team reported on the current state of development: which part of the methodology is being addressed at the moment and where we stand timewise.

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State of play

1. Definition	DONE
2. Development	ONGOING
i) First phase	CLOSING*
ii) Second phase	ONGOING
3. Testing	TO BE COMMENCED
4. Delivery	ON HOLD

* Any comments are still welcomed with regards to the output produced during the first phase | [GitHub](#)

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Slide 6 | State of play

The definition phase was completed back in April, after the second workshop. The development first phase, which focused on deriving indicators and maturity levels from the

FAIR principles comes to an end. The second phase, which primarily focuses on harmonising the indicators per areas/principles and developing maturity levels and pathways is currently underway. The output of this phase will be a draft set of core assessment criteria. The testing phase has not yet started but the editorial team is investigating approaches. Lastly, the delivery phase (i.e. publication of results) has not started yet.

The editorial team specified that there will be a fifth physical workshop in Helsinki - RDA 14th Plenary session - and a sixth one (virtual) in December before the end of the year.

4. Later, the editorial team walked the Working Group through the consolidated indicators and their status.

The editorial team reminded the participants that the indicators put forth are derived from the WG's contributions. Furthermore, a bottom-up approach was undertaken, where the WG with the support of the editorial team looked at atomic indicators and their respective - binary - maturity levels.

The slide presented below is the work achieved so far by the WG since last June.

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Overview | Indicators & levels

- Under discussion
- Provisionally agreed

Area	Indicator	Status
F	F1 (Meta)data are assigned globally unique and persistent identifiers	Provisionally agreed
	F2 Data are described with rich metadata	Under discussion
	F3 Metadata clearly and explicitly include the identifier of the data they describe	Provisionally agreed
	F4 (Meta)data are registered or indexed in a searchable resource	Under discussion
A	A1 (Meta)data are retrievable by their identifier using a standardised communication protocol	Provisionally agreed
	A1.1 The protocol is open, free and universally implementable	Under discussion
	A1.2 The protocol allows for an authentication and authorisation where necessary	Provisionally agreed
A2	A2 Metadata are accessible, even when the data are no longer available	Provisionally agreed
	I1 (Meta)data use a formal, accessible, shared and broadly applicable language for knowledge representation	Under discussion
I	I2 (Meta)data use vocabularies that follow the FAIR principles	Under discussion
	I3 (Meta)data include qualified references to other (meta)data	Under discussion
	R1 (Meta)data are richly described with a plurality of accurate and relevant attributes	Under discussion
R	R1.1 (Meta)data are released with a clear and accessible data usage license	Provisionally agreed
	R1.2 (Meta)data are associated with detailed provenance	Provisionally agreed
	R1.3 (Meta)data meet domain-relevant community standards	Under discussion

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Slide 12 | Overview | Indicators & levels

Further development actions, as part of the charter and outlined in the methodology, will be done with the indicators presented and agreed upon at the workshop. Nevertheless, as the RDA plenary reaches a broad audience, the editorial team will still collect late feedback on the indicators in the next - *physical* - workshop in October.

The status per FAIR areas is as follows:

- F1 and F3 are agreed upon while F4 is still under discussion. There has been discussion on whether the three indicators initially proposed cover all cases, and proposals were made to combine the three indicators into one. F2 will be covered at a joint meeting at the next [RDA plenary session](#).
- A1, A1.2 and A2 are agreed upon. As for A1.1, a proposal was made to include human action as 'protocol'.
- All Interoperability indicators are under discussion. There is no resolution about the definition of 'knowledge representation' for I1. As for I2, there is currently no agreement in the group on which FAIR principles vocabularies and other semantic artefacts should satisfy. Lastly, concerning I3, some proposals were made to change the priorities of two indicators. Furthermore, an indicator about metadata references to other data was added.
- R1.1 and R1.2 are agreed upon. Yet, there is no agreement on 'richness' and 'plurality of attributes'. In order to come to an agreement on the R indicators the WG will have to decide on what are the *requirements for rich metadata as for FAIR*. This will be further discussed at a joint session at the next [RDA plenary session](#), which Edith will help organise. Contributions will be asked prior to the session in order to prepare and scope the discussion in Helsinki and reach a conclusion. Edith invited all attendees to participate in such meetings in order to avoid side discussions.

Here below are the key takeaways from the discussion related to the indicators and their levels:

- A comment was made about the fact that there are various kinds of metadata depending on the domain and purpose. Rob Hooft highlighted that the importance of metadata standards also varies across disciplines. Mustapha Mokrane added that the absence of metadata standards in a domain should not prevent FAIRness, and that there is a difference between reuse within one context and reuse in different contexts/disciplines.
- Edit Herczog will contact the organisers of the joint meeting with the purpose to define discussion items. Susanna-Assunta Sansone and Barbara Sierman volunteered to help.

- Standards must be referenceable, our references to standards are currently rather vague. The group should look at how other communities are referencing standards. Makx indicated that this vagueness comes from the FAIR principles themselves and the GO-FAIR definitions. This issue will be looked at in coordination with FAIRsharing.
- Carole Goble indicated that the GitHub discussions are too complex to follow and would be more understandable if they contained examples of datasets that have already been made FAIR. Makx Dekkers explained that the goal of the work currently being done is to create a common reference for evaluating FAIR data, which would make evaluations comparable. Carole Goble will invite people who try to use these indicators/metrics to their data to contribute to the GitHub discussions. Carole also mentioned that it would be easier to interpret the GitHub discussions if there was a summary of points and final decision for each indicator.

Makx Dekkers clarified that he is moderating the discussions on GitHub but the WG is responsible for agreeing and finding consensus on the indicators.

5. Later, Makx Dekkers presented the two options to build maturity levels.
 - a. A two-level scale for the indicators (i.e. YES/NO)
 - b. FAIRness across indicators per levels, which is a more complex solution. The editorial team will make a proposition to the WG in the weeks to come with possibilities to combine indicators into levels.

Development | Levels



Option 1

FAIRness on a two level scale for the indicator

F1-01M – Metadata is identified by a persistent identifier

- No persistent identifier [**Not FAIR**]
- Persistent identifier [**FAIR**]



Option 2

FAIRness across indicator per levels

Multiple indicators with consolidated levels – *whenever possible*

- Level 2
- Level 1
- Level 0

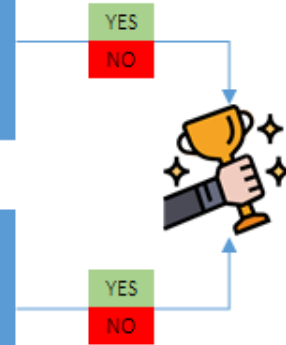
For example:

A1-01D+A1-02D:

level 2 – Data can be accessed automatically

level 1 – Data can be accessed manually

level 0 – Data cannot be accessed automatically or manually



Then, Makx introduced the 'weighting' of the indicators. As illustrated on the slide below there are three priority levels: i) Mandatory / Essential: indicator **MUST** be satisfied for FAIRness (e.g. a persistent identifier), ii) Recommended / Important : indicator **SHOULD** be satisfied, if at all possible, to increase FAIRness and iii) Optional / Useful : indicator **MAY** be satisfied, but not necessarily so.

Weighting the indicators, developed as part of the WG, following the [key words for use](#) in RFC2119

- > **Mandatory/Essential**: indicator **MUST** be satisfied for FAIRness
- > **Recommended/Important**: indicator **SHOULD** be satisfied, if at all possible, to increase FAIRness
- > **Optional/Useful**: indicator **MAY** be satisfied, but not necessarily so

PRINCIPLE	INDICATOR_ID	INDICATORS	PRIORITY	
F	F1	F1-01M	Metadata is identified by a persistent identifier	Recommended
	F1	F1-01D	Data is identified by a persistent identifier	Mandatory
	F1	F1-02M	Metadata is identified by a universally unique identifier	Recommended
	F1	F1-02D	Data is identified by a universally unique identifier	Mandatory
	F2	F2-01M	Sufficient metadata is provided to allow discovery, following domain/discipline-specific metadata standard	Recommended
	F2	F2-02M	Metadata is provided for the discovery-related elements defined by the RDA Metadata IG, as much as possible and relevant, if no domain/discipline-specific metadata standard is available	Recommended
	F3	F3-01M	Metadata includes the identifier for the data	Mandatory
	F4	F4-01M	Metadata is offered/published/exposed in such a way that it can be harvested and indexed	Recommended

The following changes were proposed:

- F4-01M from recommended to mandatory.
- Inclusion of A1.1-03D as indicator and priority set to mandatory.
- A suggestion was made for having R1-01M and R1-02M to be mandatory, yet there are no standards agreed upon. It should be mandatory to provide sufficient metadata to be reused in the context in which the metadata was generated. Still there is no distinction between the specific context and the broader one. This matter will be further discussed during the next workshop.

Here are the key takeaways of the discussion relative to the weighting:

- From the two perspectives introduced, “How FAIR is this data” and “How the FAIRness of this data can be improved, the WG seems to favour the second. Indeed, as many times mentioned, the FAIR principles are aspirational, it is a journey. It will be complex to measure, in particular through time, exactly how FAIR data is. As a consequence, the result of such an evaluation should be *areas for improvement*. The indicators as such can help define priorities along the journey.

Barbara Sierman stressed that FAIR compliance is something that needs to be sustained over time and there ought to be some sort of guidelines on why and how to use the indicators explaining this (e.g. some indicators may satisfy the criteria of today and not of tomorrow and vice-versa).

- The core criteria to be developed should be used for continuous self-development (e.g. journey as opposed to a static tool) as it provides indications for necessary improvement. Additionally, they should be designed to permit the creation of an expandable self-assessment.
- The evaluation should allow comparison among different existing evaluation approaches. As there are different motivations for evaluating (i.e. depending on the evaluation the priorities may change) the working group needs to address and scope that matter in the next phase (i.e. testing phase).
- The meaning of knowledge representation is not clear yet. Makx Dekkers proposed to include a glossary, aligned with definitions proposed from other working groups.
- Should only FAIR-compliant vocabularies be used? How to manage recursion? What should be the minimum level to comply with these criteria? Currently, there are a few FAIR vocabularies. There will be a workshop organised on the topic, with the goal to create a glossary of terms (i.e. 'rules' to know what it means to be a FAIR compliant vocabulary).
- As many standards are community-specific, there is a need to have more details on what a community standard means. Oya Beyan suggested to contact communities to gather input about community standards.
- The editorial team will create a GitHub thread to discuss the usefulness of defining a minimum set of indicators for FAIRness. In that regard, there is a need to define the scope of the minimum set of indicators for FAIRness. In any case, all mandatory metrics should be applicable to all cases, the priorities of other metrics will vary according to the case.
- Open issues currently related to metadata will be discussed at the [joint meeting](#) on the 25th of October at the RDA Plenary in Helsinki.

Finally, the editorial team presented an approach scoring and visualising the FAIRness of a digital resource. The digital resource being analysed would be ranked from level zero to level five. Level five being the highest score.

Development | Scoring

	Mandatory	Recommended	Optional
Level 0	○		
Level 1	●		
Level 2	●	◐	
Level 3	●	●	
Level 4	●	●	◐
Level 5	●	●	●

Level 0–The resource did not comply with all the mandatory indicators

Level 1–The resource did comply with all the mandatory indicators, and less than half of the recommended indicators

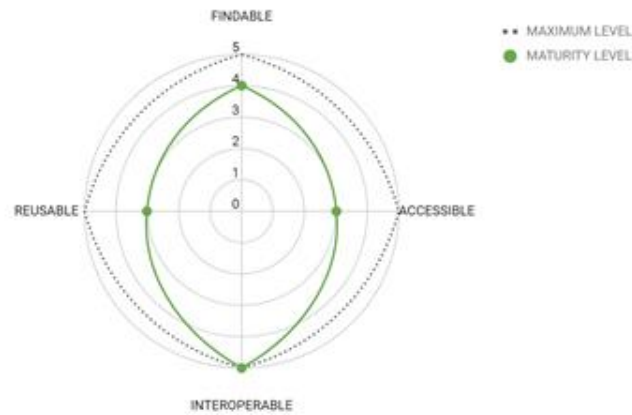
Level 2–The resource did comply with all the mandatory indicators and at least half of the recommended indicators

Level 3–The resource did comply with all the mandatory and recommended indicators, and less than half of the optional indicators

Level 4–The resource did comply with all the mandatory and recommended indicators and at least half of the optional indicators

Level 5–The resource did comply with all the mandatory, recommended and optional indicators

Furthermore, the score could be visualized in the shape of a radar chart per FAIR area but also per indicator (i.e. YES/NO compliance to the indicator).



FAIR Principles	MAXIMUM LEVEL	MATURITY LEVEL	AMBITION
FINDABLE	5	4	+1
ACCESSIBLE	5	3	+2
INTEROPERABLE	5	5	+0
REUSABLE	5	3	+2

Here are the key takeaways of the discussion relative to the scoring and visualisation:

- There was an overall agreement on the usefulness of the levels.
- Scoring can be undermining sometimes (i.e. people will see a five better than a three or a two). In that sense, some tools use a matrix rather than a score. Yet, if the editorial team were to drop the level, there is a need to find a better solution to allow comparison of the FAIRness of digital objects.
- Some members shared the view that the visualization is important but up to the tool. The scoring is more important, in particular for this WG.
- The dotted line representing the maximum level is confusing.
- The editorial team will create a GitHub issue that will explore '*how to mark the different levels*'.
- Maggie Helström raised that there will be different methods for using the indicators for scoring and that guidelines will need to be provided on how to handle scoring with community specific criteria.

Even though the indicators and their maturity levels are still under development, the editorial team introduced a potential scoring mechanism and its visualisation. The ultimate purpose is to first agree on the usefulness of such a scoring mechanism and then how it should be designed.

6. The editorial team outlined the approach towards testing the set of indicators.

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Testing the set of indicators

We identified two levels of testing;

1st Level

- Test whether the indicators are aligned with the current methodologies to measure FAIRness
- i) Indicator(s) not present in the methodology but in the core set of assessment criteria
- ii) Indicator(s) present in the methodology but not present in the core set of assessment criteria

In scope for the WG

2nd Level

- Owner of methodologies to test the core set of assessment criteria (i.e. Indicators with their methodology and a given dataset)

In scope for future work

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Slide 34 | Testing the set of indicators

Follow-up Action Plan

- Provide feedback to the proposals presented at the meeting of today on the GitHub, if at all possible, **by the 11th October**
- Share feedback about consolidation and weighting of indicators and maturity levels on the GitHub
- Share feedback about the structure for tool set and data checklist on the GitHub

WORKSHOP #5

—
RDA 14th Plenary session in Helsinki (FI)
23rd October 2019
Breakout 2 – 14.30 - 16.00 EEST