FAIR Principles

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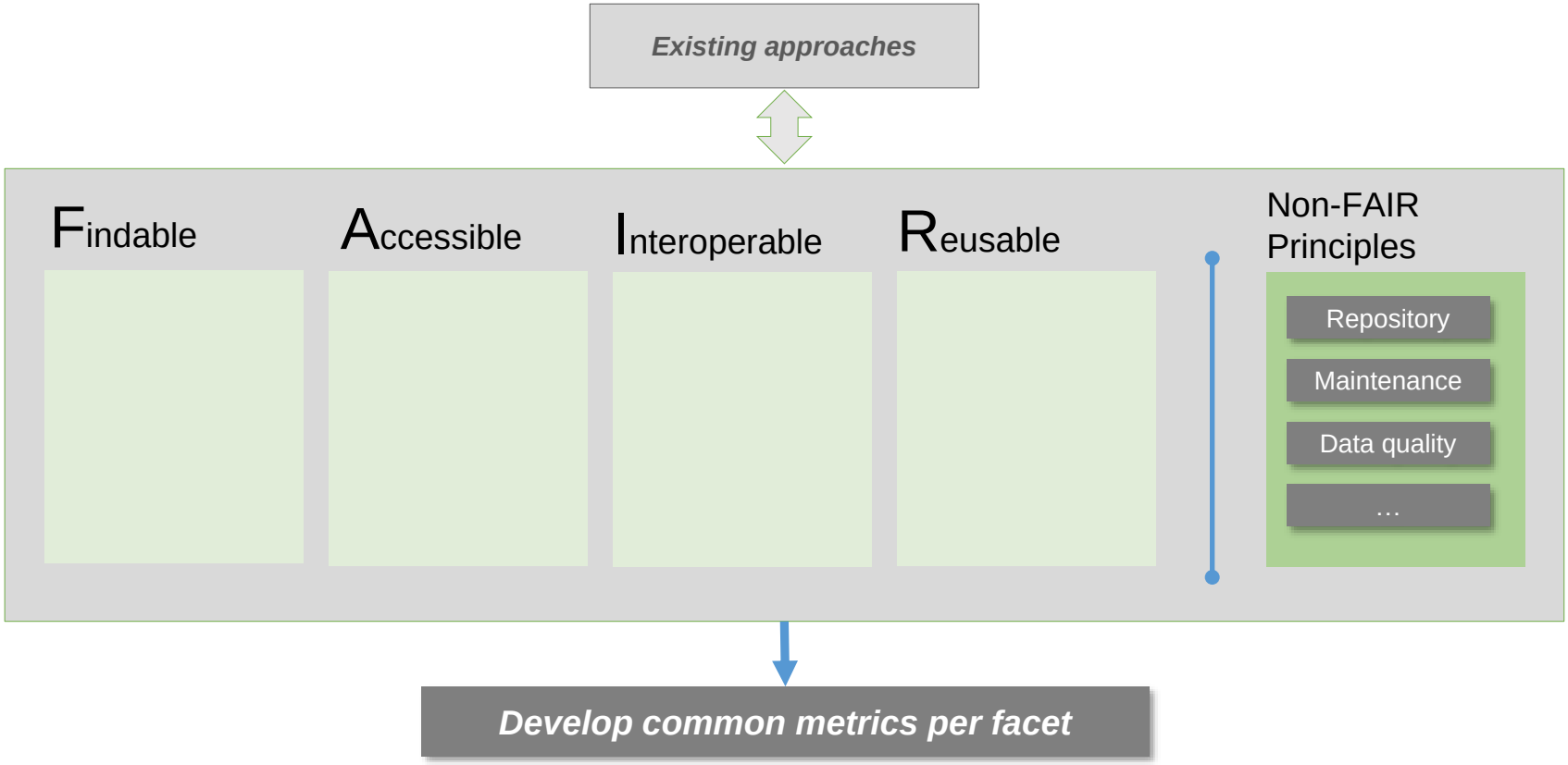
Beyond FAIR

Analysis of existing approaches


Existing approaches
Findable
Accessible
Interoperable
Reusable
Non-FAIR Principles
Repository
Maintenance
Data quality
…
Develop common metrics per facet

Non-FAIR Principles

- Data repository
- Curation and maintenance
- Open data
- Data quality
- Others

LEGEND

1	ANDS-NECTAR-RDS-FAIR data assessment tool	ARDC
2	DANS-Fairdat	DANS
3	DANS-Fair enough?	DANS
4	The CSIRO 5-star Data Rating tool	CSIRO
5	FAIR Metrics Questionnaire	The FAIR Metrics Group
6	Stewardship Maturity Mix	NOAA's CICS-NC, NOAA's NCDC
7	FAIR Evaluator	GO FAIR, LUMC CBGP, IDS, OeRC, IQSS
8	Data Stewardship Wizard	ELIXIR NL/CZ
9	Checklist for Evaluation of Dataset Fitness for Use	Assessment of Data Fitness for Use WG (WDS/RDA)
10	RDA-SHARC Evaluation	SHARC IG (RDA)
11	WMO-Wide Stewardship Maturity Matrix for Climate Data	The SMM-CD WG
12	Data Use and Services Maturity Matrix	The MM-Serv WG

Principle

 # Facet

1 Question
- Option #1
- Option #2
- Option #3

Potential Overlap

X1 Data repositiory

1 What type of repository or registry is the metadata record in ?
- The data is not described in any repository
- Local institutional repository
- Domain-specific repository
- Generalist public repository
- Data is in one place but discoverable through several registries

3 Is the data repository you have chosen trustworthy
- No
- Yes

9 Is dataset located within a CoreTrustSeal-certified repository ?
- No
- Yes

9 Is dataset located within a World Data System or Data Seal of Approval certified repository?
- No
- Yes

9 Repository representative stipulates that structure, harmonization, completeness, and correctness of the dataset comports with typical data curation activities c
- No
- Somewhat
- Yes

10 Does the researcher use data repositories for the storage of data ?
- Never /NA
- If mandatory
- Sometimes
- Always

RESEARCH DATA ALLIANCE

. . .

6 Preservability

- Any storage location / Data only
- Non-designated repository / Redundancy / Limited archiving metadata
- Designated archive / Redundancy / Community-standard archiving metadata / Conforming to limited archiving standards
- Conforming to community archiving standards
- Archiving process / Performance controlled, measured and audited / Future archiving standard changes planned

11 Preservation

- Any storage location; Data only; Data not backed up.
- Non-designated repository; A backup copy of electronic data is made.
- Designated archive; Basic retention policy publicly defined. Routine backups made, including offsite copy.
- Previous + Conforming to community archiving standards. Comprehensive retention policy defined and implemented.
- Previous + Archiving process performance controlled, measured, and audited; Future archiving standard changes planned.

X2 Curation and maintenance

4 Updated - part of a regular data collection program or series, with clear maintenance arrangements and update schedule

- one-time dataset
- part of series - occasional/irregular update
- part of series - regular scheduled updates

4 Curated - commitment to ensuring the data is available long term

- Once-off dump, no ongoing commitment
- Best effort, project website
- Public or institutional repository (e.g. CKAN, GitHub)
- Certified repository

11 Governance

- Responsibility is not defined; No person is assigned.
- Responsible entity is identified; Accountability and competency are not well-defined.
- Responsibility/accountability and compliance mechanisms are defined; Good competency; Processes established conforming to community standards
- Previous + Competency defined; Conforming to international standards; auditable.
- Previous + Accountability and responsibility well defined and fully compliant with international standards; transparent; monitored and audited.

X3 Open data

3 FAIR enough, but also Open? Will your data be published as open as possible and as protected as necessary?

- No
- Yes

8 Will you be working with the philosophy 'as open as possible' for your data?

- No
- Yes

X4 Data quality

6 Data Quality Control / Monitoring

- None or Sampling unknown or spotty / Analysis unknown or random in time
- Sampling and analysis are regular in time and space / Limited productspecific metrics defined & implemented
- Sampling and analysis are frequent and systematic but not automatic / Community metrics defined and partially implemented / Procedure documented and available online
- Anomaly detection procedure well-documented and fully implemented using community metrics, automatic, tracked and reported / Limited quality monitoring metadata

6 Data Quality Assessment

- Algorithm/method/model theoretical basis assessed (methods and results online)
- Research product assessed (methods and results online)
- Operational product assessed (methods and results online)
- Quality metadata assessed / Limited quality assessment metadata
- Assessment performed on a recurring basis Conforming to community quality metadata & standards External ranking

11 Quality Assurance & Control *F2*

- Ad hoc or no data quality assurance (QA) & control (QC) procedure or information unknown.
- QA/QC procedure are defined, documented, and partially implemented.
- QA/QC procedure are well-defined according to community best practices, documented and fully applied.
- Previous + provision of error statistics published or tracked with results made available online and communicated to data providers; Procedure for user feedback, improveme
- Previous + detailed analysis of errors and gaps at space-time unit level: (Station, grid-points, daily, monthly and or annual time-scale, etc.); QA/QC procedure monitored; Re

11 Quality Assessment

- Product quality assessment not done or done internally and information not available.
- Assessed by Principal Investigator (PI) or data producer; Assessment results available online.
- Previous + Product validation and evaluation done by PI published in peer-reviewed journal.
- Previous + Independent product validation and evaluation published in peer-reviewed journal.
- Previous + The complete product provenance is captured and publicly available.

X5 Others

8 Will data interpretation and modeling require significant compute infrastructure capacity?

- No
- Yes

8 Will you be doing (automated) knowledge discovery?

- No
- Yes

11 Uncertainty Analysis

- Uncertainty estimates not available.
- Uncertainty estimates presented without explanation.
- Uncertainty estimates presented with partial explanation.
- Full uncertainty budget available with all assumptions; Estimates of accuracy of trend available.
- Full uncertainty assessment published in peer reviewed journal.