ISO 19157-3
Quality Measure Register

Project leaders
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and
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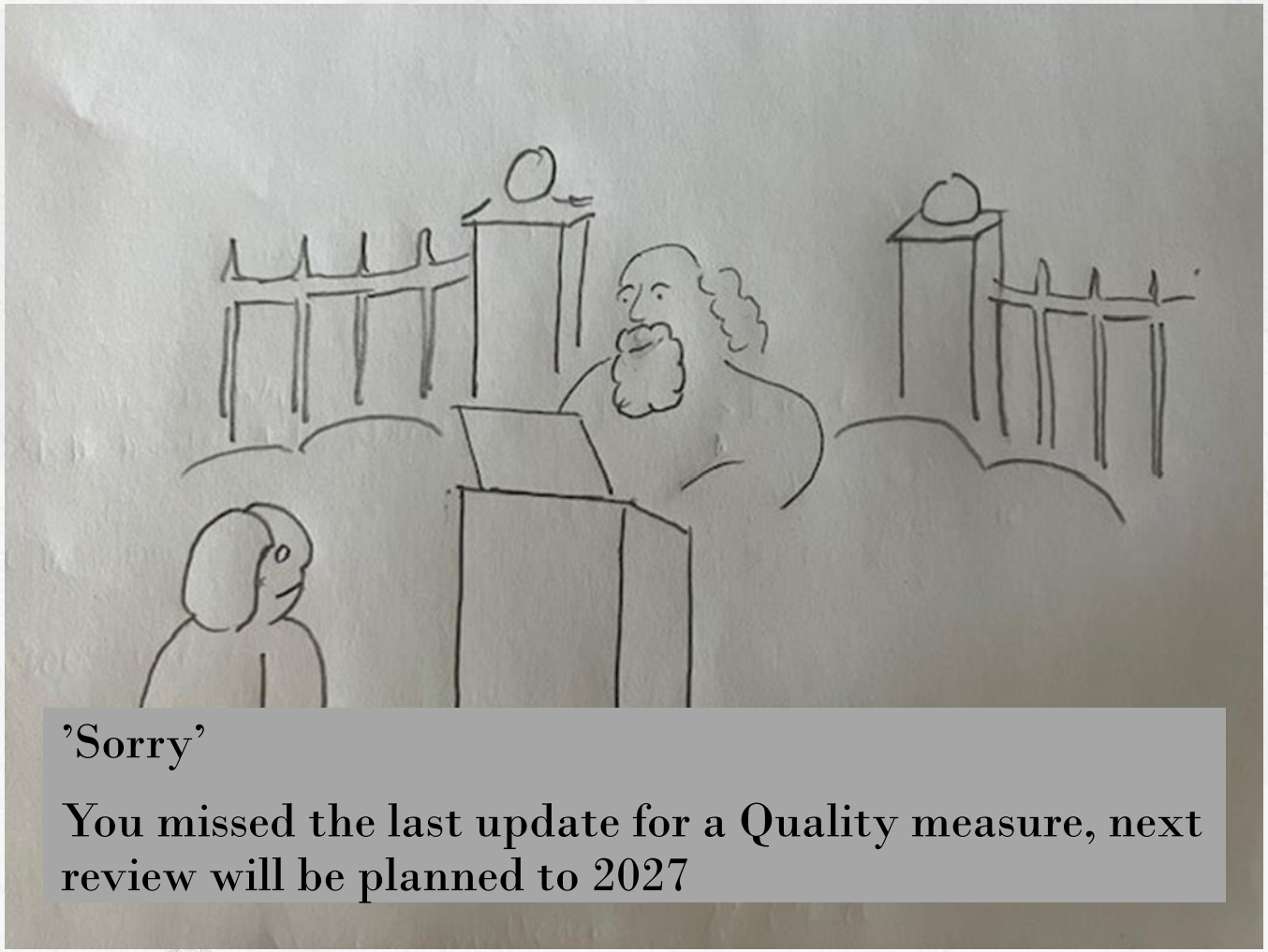
Today's talk

- Why we saw a need for a Data Quality Measure register
- How it works in practice
- How it will be managed
- What is going on


'Sorry'
You missed the last update for a Quality measure, next review will be planned to 2027

From the past…

Data quality measures in earlier version of the quality standard were in a normative annex typeset as tables in a PDF:

- ISO 19138:2006
- ISO 19157:2013

Currently ISO 19157-3 (expected publication in 2025)

…to the future

- Readable for a human
- Readable and actionable for a machine
- New measures can be added easily, as per procedures defined in ISO 19157-3
- Informative register
- The register Owner is ISO TC 211
- The registration authority is OGC, confirmed in 2022
- A control body with experts defined in 19157-3

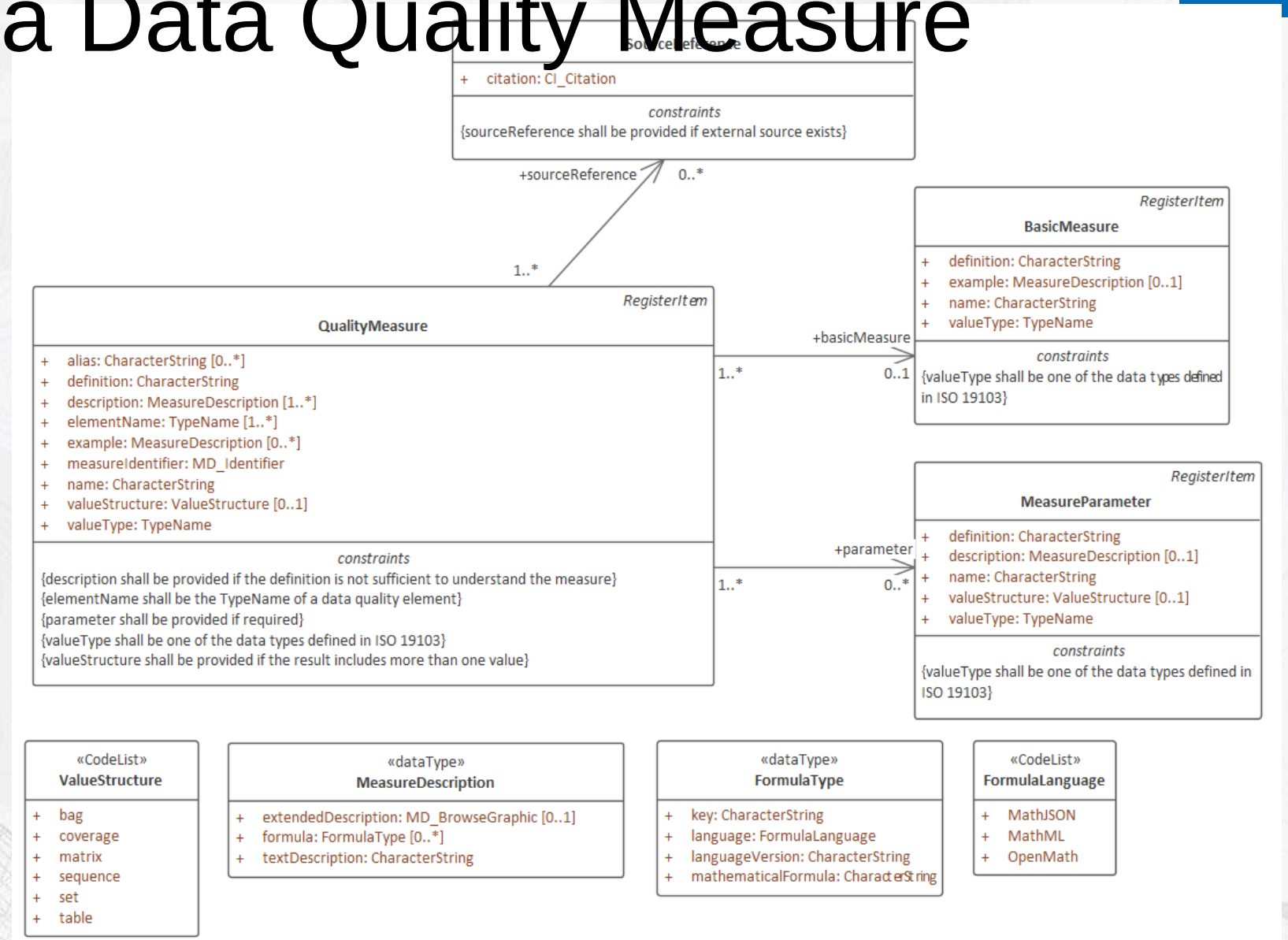
Structure of a Data Quality Measure

From ISO 19157-1:2023

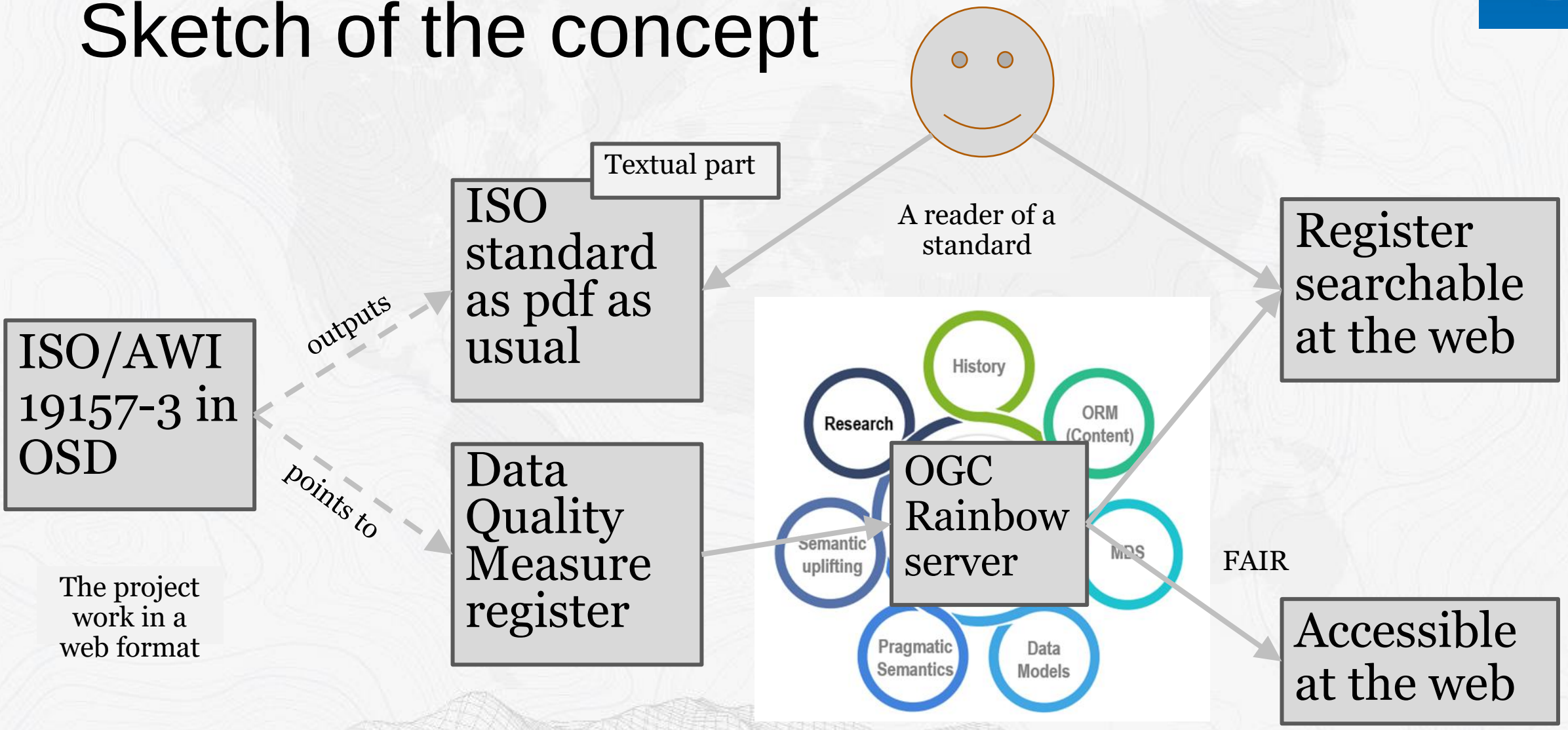
Beside this there is register content from 19135:

- Status of an item
- Versioning of items
- URI

... and other metadata

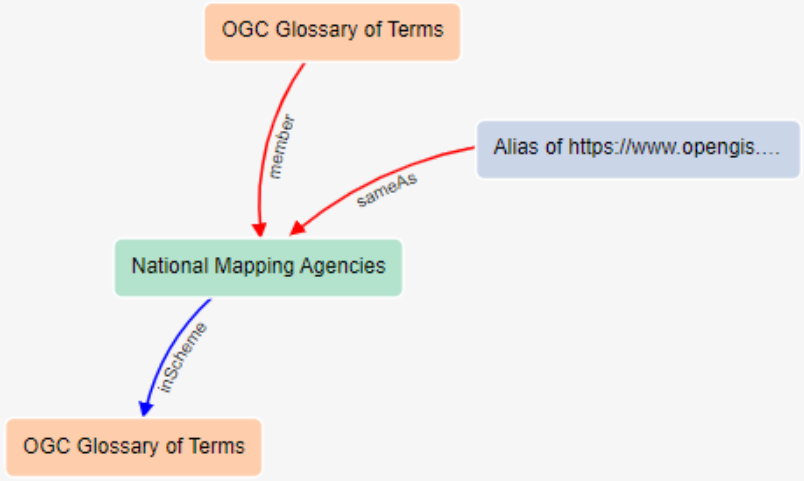


Sketch of the concept



OGC RAINBOW

- A Web accessible source of information about things
- The “core” OGC RAINBOW can be accessed at https://www.opengis.net/def and holds definitions for terms defined by OGC
  example: National Mapping Agencies (preferred label)
  URI: http://www.opengis.net/def/glossary/term/NationalMappingAgencies



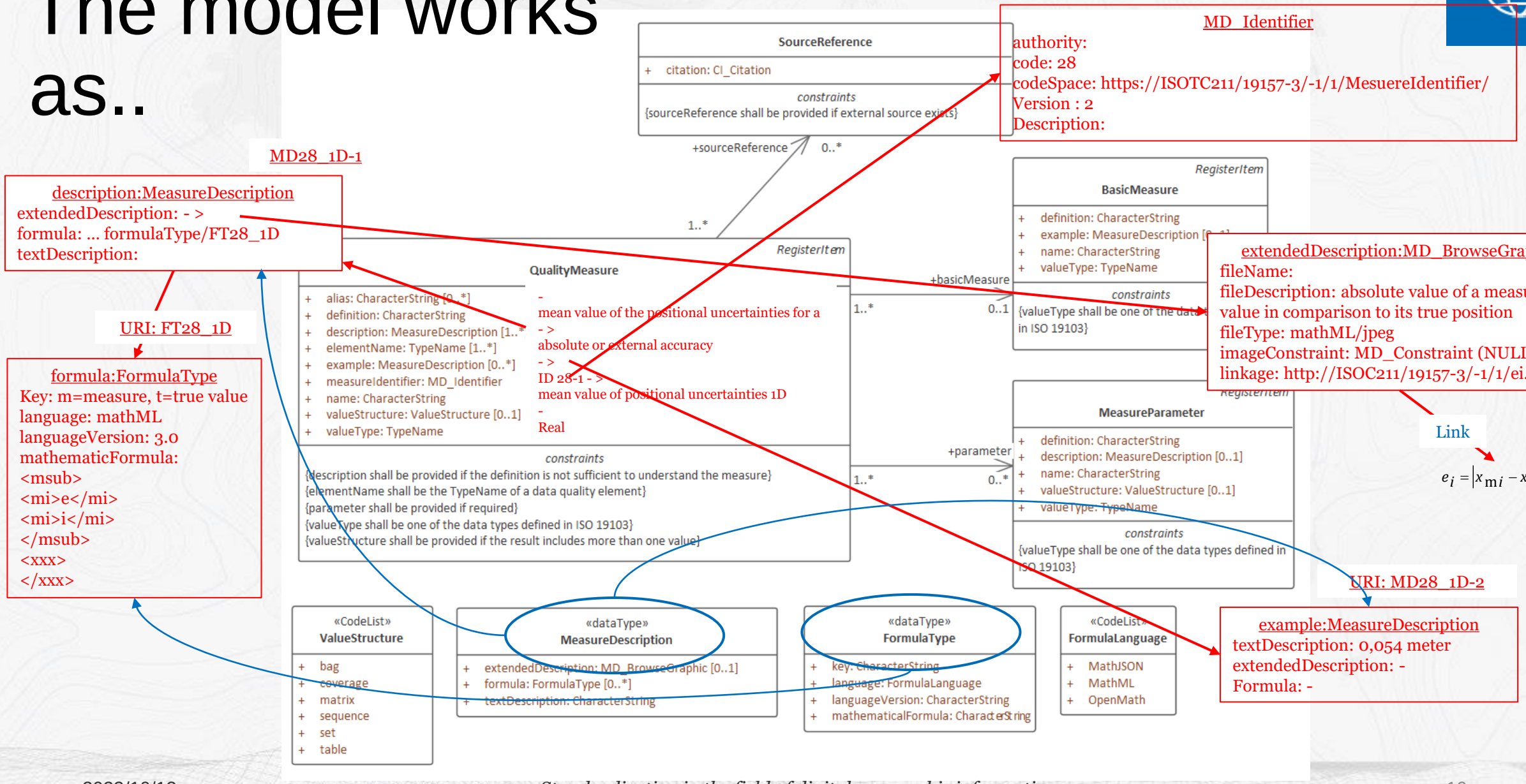
Definition
National government agencies, such as the UK's Ordnance Survey, France`s Institut Geographique National (IGN) and the US's US Geological Survey and Federal Geographic Data Committee, that are chartered to provide national mapping products and services

Data quality measures register

- From ISO 19157:2013:
  - Clause 8 (Defining DQ measures) stays in ISO 19157-1
  - Annex D goes to ISO 19157-3 online register.
- New in ISO 19157-3:
  - Roles, management & procedures for DQ Measures registration

Line	Component	Description
1	Name	mean value of positional uncertainties (1D, 2D and 3D)
2	Alias	-
3	Element name	absolute or external accuracy
4	Basic measure	not applicable
5	Definition	mean value of the positional uncertainties for a set of positions where the positional uncertainties are defined as the distance between a measured position and what is accepted as the corresponding true position
6	Description	For a number of points (N), the measured positions are given as x_{mi}, y_{mi} and z_{mi} coordinates depending on the dimension in which the position of the point is measured. A corresponding set of coordinates, x_{ti}, y_{ti} and z_{ti}, are considered to represent the true positions. The positional uncertainties are calculated as: 1D: $e_i = \lvert x_{mi} - x_{ti} \rvert$ 2D: $e_i = \sqrt{(x_{mi}-x_{ti})^2+(y_{mi}-y_{ti})^2}$ 3D: $e_i = \sqrt{x_{mi}-x_{ti})^2+(y_{mi}-y_{ti})^2+(z_{mi}-z_{ti})^2}$ The mean positional uncertainties of the horizontal absolute or external positions are then calculated as $\bar{e} = \frac{1}{N}\sum_{i=1}^{N} e_i$ A criterion for the establishing of correspondence should also be stated (e.g. allowing for correspondence to the closest position, correspondence on vertices or along lines). The criterion/criteria for finding the corresponding points shall be reported with the data quality evaluation result.
7	Parameter	-
8	Value type	Real
9	Value structure	-
10	Source reference	-
11	Example	0,054 meter
12	Identifier	28

The model works as..



DQM – An example of a formula on OGC RAINBOW

ConceptScheme Concept

Definition	$e_i = x_{mi} - x_{ti}$
http://www.opengis.net /def/metamodel/isodqm/formulaKey	For a number of points (N), the measured positions are given as xmi , ymi and zmi coordinates depending on the dimension in which the position of the point is measured. A corresponding set of coordinates, xti , yti and zti , are considered to represent the true positions. Formula for 1D positional uncertainty.
http://www.opengis.net /def/metamodel/isodqm /formulaLanguage	MathML
http://www.opengis.net /def/metamodel/isodqm /formulaLanguageVersion	1.0

Concept

Preferred Label

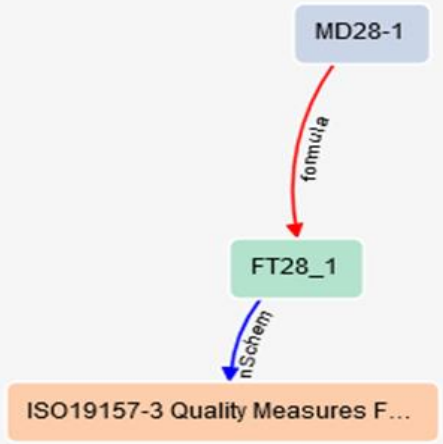
FT28_1

URI

https://standards.isotc211.org/19157/-3/1/dqc/content/formulaType/FT28_1 ↗

Within Vocab

ISO19157-3 Quality Measures Formulas



Example in turtle form

Formula.ttl

<https://standards.isotc211.org/19157/-3/1/dqc/content/formulaType/FT28_1> a skos:Concept ;

dqm:formulaKey "For a number of points (N), the measured positions are given as xmi , ymi and zmi coordinates depending on the dimension in which the position of the point is measured. A corresponding set of coordinates, xti , yti and zti , are considered to represent the true positions. Formula for 1D positional uncertainty." ;

dqm:formulaLanguage "MathML" ;

dqm:formulaLanguageVersion "1.0" ;

skos:definition "<math xmlns=\"http://www.w3.org/1998/Math/MathML\">
<msub><mi>e</mi><mi>i</mi></msub><mo>=</mo>
<mfenced close=\"|\"open=\"|\"><mrow><msub><mi>x</mi>
<mrow><mi>m</mi><mi>i</mi></mrow></msub><mo>-</mo>
<msub><mi>x</mi><mrow><mi>t</mi><mi>i</mi></mrow>
</msub></mrow></mfenced></math>" ;

skos:inScheme <https://standards.isotc211.org/19157/-3/1/dqc/content/formulaType> ;

skos:prefLabel "FT28_1" .

Example in JSON-LD form


```
[
  {
    "@id": "https://standards.isotc211.org/19157/-3/1/dqc/content/formulaType/FT28_1",
    "@type": [
      "http://www.w3.org/2004/02/skos/core#Concept"
    ],
    "http://www.opengis.net/def/metamodel/isodqm/formulaKey": [
      {
        "@value": "For a number of points (N), the measured positions are given as xmi , ymi and zmi
        coordinates depending on the dimension in which the position of the point is measured. A
        corresponding set of coordinates, xti , yti and zti , are considered to represent the true
        positions. Formula for 1D positional uncertainty."
      }
    ],
    "http://www.opengis.net/def/metamodel/isodqm/formulaLanguage": [
      {
        "@value": "MathML"
      }
    ],
    "http://www.opengis.net/def/metamodel/isodqm/formulaLanguageVersion": [
      {
        "@value": "1.0"
      }
    ],
    "http://www.w3.org/2004/02/skos/core#definition": [
      {
        "@language": "en",
        "@value": "<math
        xmlns=\"http://www.w3.org/1998/Math/MathML\"><msub><mi>e</mi><mi>i</mi></msub><mo>=</mo><mfence
        d close=\"|\"
        open=\"|\"><mrow><msub><mi>x</mi><mrow><mi>m</mi><mi>i</mi></mrow></msub><mo>-</mo><msub><mi>x<
        /mi><mrow><mi>t</mi><mi>i</mi></mrow></msub></mrow></mfenced></math>"
      }
    ],
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        "@value": "FT28_1"
      }
    ]
  }
]
```

ISO 19157-3: Updates

- ISO 19157-3 strongly depends on ISO 19135 currently under revision
- ISO/CD 19157-3 timeline slightly delayed
- No significant impact expected on the DIS timing – timing of ISO 19135 and its impact on ISO 19157-3 closely monitored.

Whats up now

- The review of 19135 is late
- But we still working for CD this year and DIS in april 2024
- OGC acts as Registration Authority and will set up the register
- A Control Body will be set up
- Processes will be set up to manage new measures, included in the standard

Thank you!

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