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# Preuve de concept de restitution automatisée (XML ISO-19157)

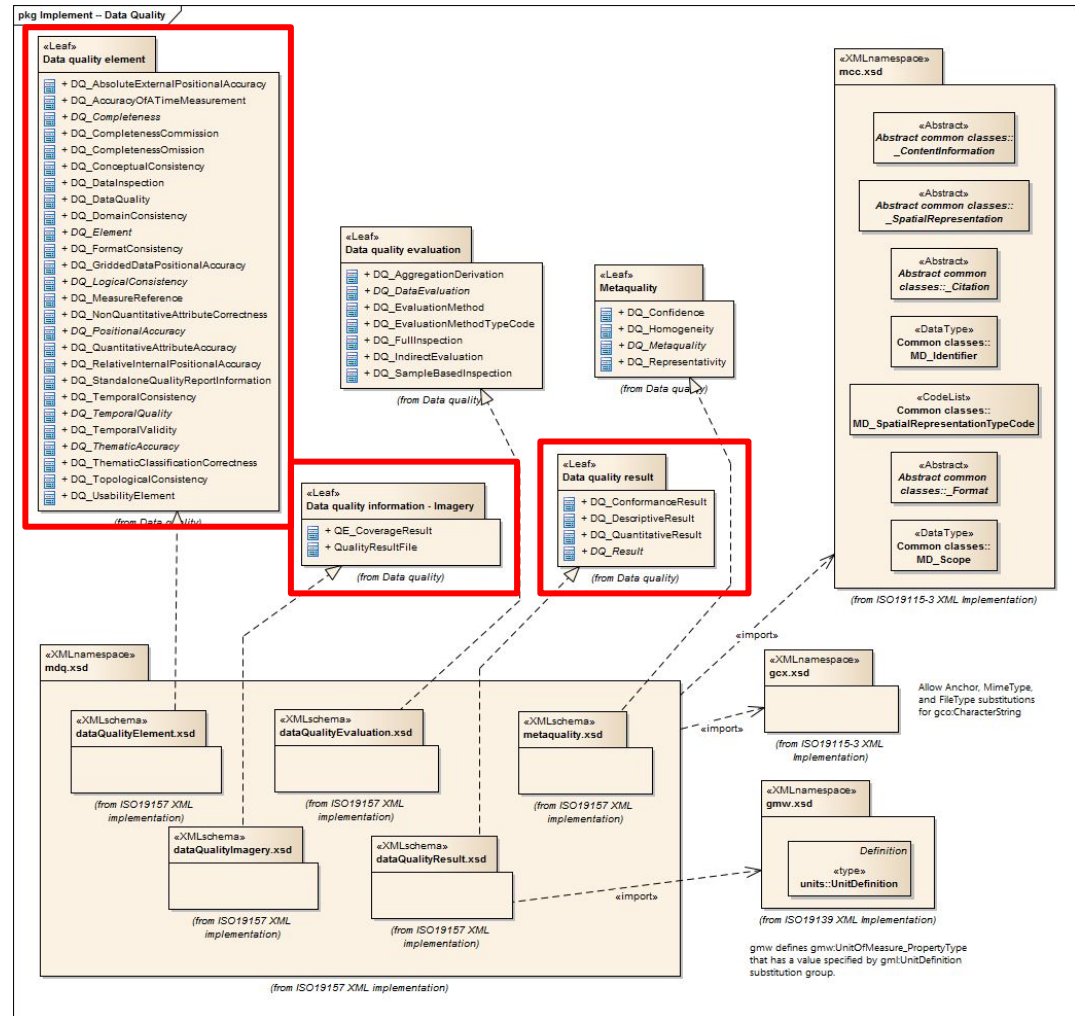
CNIG - Réunion QuaDoGéo - 7 Octobre 2021  
Mathieu Rajerison - Cerema Med

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# ISO 19157

## Metadata for Data Quality

<https://github.com/ISO-TC211/XML/blob/master/standards.iso.org.annotated/iso/19157/-2/mdq/1.0/index.html>



# ISO 19157

## Metadata for Data Quality

<https://github.com/ISO-TC211/XML/blob/master/standards.iso.org.annotated/iso/19157/-2/mdq/1.0/index.html>

pkg Implement -- Data Quality

«Leaf»

Data quality element

- + DQ\_AbsoluteExternalPositionalAccuracy
- + DQ\_AccuracyOfATimeMeasurement
- + DQ\_Completeness
- + DQ\_CompletenessCommission
- + DQ\_CompletenessOmission
- + DQ\_ConceptualConsistency
- + DQ\_DataInspection
- + DQ\_DataQuality
- + DQ\_DomainConsistency
- + DQ\_Element
- + DQ\_FormatConsistency
- + DQ\_GriddedDataPositionalAccuracy
- + DQ\_LogicalConsistency
- + DQ\_MeasureReference
- + DQ\_NonQuantitativeAttributeCorrectness
- + DQ\_PositionalAccuracy
- + DQ\_QuantitativeAttributeAccuracy
- + DQ\_RelativeInternalPositionalAccuracy
- + DQ\_StandaloneQualityReportInformation
- + DQ\_TemporalConsistency
- + DQ\_TemporalQuality
- + DQ\_TemporalValidity
- + DQ\_ThematicAccuracy
- + DQ\_ThematicClassificationCorrectness
- + DQ\_TopologicalConsistency
- + DQ\_UsabilityElement

(from Data Quality)

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D  
E

# Les mesures

DQ\_AbsoluteExternalPositionalAccuracy

DQ\_AccuracyOfATimeMeasurement

AbstractDQ\_Completeness

DQ\_CompletenessCommission

DQ\_CompletenessOmission

DQ\_ConceptualConsistency

DQ\_DataInspection

DQ\_DataQuality

DQ\_DomainConsistency

AbstractDQ\_Element

DQ\_FormatConsistency

DQ\_GriddedDataPositionalAccuracy

AbstractDQ\_LogicalConsistency

DQ\_MeasureReference

DQ\_NonQuantitativeAttributeCorrectness

AbstractDQ\_PositionalAccuracy

DQ\_QuantitativeAttributeAccuracy

DQ\_RelativeInternalPositionalAccuracy

DQ\_StandaloneQualityReportInformation

DQ\_TemporalConsistency

AbstractDQ\_TemporalQuality

DQ\_TemporalValidity

AbstractDQ\_ThematicAccuracy

DQ\_ThematicClassificationCorrectness

DQ\_TopologicalConsistency

DQ\_UsabilityElement

# report-19157.xml

```
<?xml version="1.0"?>...  
<quadogeo>  
  <dataset>My·Dataset</dataset>  
  <metrics>  
    <!--Exhaustivy,·completeness-->  
    <AbstractDQ_Completeness·group="exhaustivity"·valueType="Real">0.6</AbstractDQ_Completeness>  
    <DQ_CompletenessCommission·group="exhaustivity"·valueType="Real">0.6</DQ_CompletenessCommission>  
    <!--Logical-->  
    <DQ_ConceptualConsistency·group="logicalConsistency"·valueType="Real">0.2</DQ_ConceptualConsistency>  
    <DQ_DataQuality·group="logicalConsistency"·valueType="Real">0.2</DQ_DataQuality>  
    <DQ_FormatConsistency·group="logicalConsistency"·valueType="Real">0.2</DQ_FormatConsistency>  
    <AbstractDQ_LogicalConsistency·group="logicalConsistency"·valueType="Real">0.2</AbstractDQ_LogicalConsistency>  
    <DQ_NonQuantitativeAttributeCorrectness·group="logicalConsistency"·valueType="Real">0.2</DQ_NonQuantitativeAttributeCorrectness>  
    <DQ_TopologicalConsistency·group="thematicAccuracy"·valueType="Real">0.2</DQ_TopologicalConsistency>  
    <!--PositionalAccuracy-->  
    <DQ_AbsoluteExternalPositionalAccuracy·group="positionalAccuracy"·valueType="Real">0.2</DQ_AbsoluteExternalPositionalAccuracy>  
    <AbstractDQ_PositionalAccuracy·group="positionalAccuracy"·valueType="Real">0.2</AbstractDQ_PositionalAccuracy>  
    <DQ_RelativeInternalPositionalAccuracy·group="positionalAccuracy"·valueType="Real">0.2</DQ_RelativeInternalPositionalAccuracy>  
    <!--ThematicAccuracy-->  
    <DQ_DomainConsistency·group="thematicAccuracy"·valueType="Real">0.2</DQ_DomainConsistency>  
    <DQ_QuantitativeAttributeAccuracy·group="thematicAccuracy"·valueType="Real">0.2</DQ_QuantitativeAttributeAccuracy>  
    <AbstractDQ_ThematicAccuracy·group="thematicAccuracy"·valueType="Real">0.6</AbstractDQ_ThematicAccuracy>  
    <!--TemporalAccuracy-->  
    <DQ_TemporalConsistency·group="temporalAccuracy"·valueType="Real">0.2</DQ_TemporalConsistency>  
    <AbstractDQ_TemporalConsistency·group="temporalAccuracy"·valueType="Real">0.2</AbstractDQ_TemporalConsistency>  
    <DQ_TemporalValidity·group="temporalAccuracy"·valueType="Real">0.2</DQ_TemporalValidity>  
    <DQ_AccuracyOfATimeMeasure·group="temporalAccuracy"·valueType="Real">0.2</DQ_AccuracyOfATimeMeasure>  
    <!--SpatialAccuracy-->  
    <DQ_GriddedDataPositionalAccuracy·group="spatialAccuracy"·valueType="Real">0.8</DQ_GriddedDataPositionalAccuracy>  
    <!--Usability-->  
    <DQ_UsabilityElement·group="usability"·valueType="Integer">1</DQ_UsabilityElement>
```

```
<?xml version="1.0"?>...  
<quadogeo>  
  <dataset>My·Dataset</dataset>  
  <metrics>  
    <!--Exhaustivy,·completeness-->  
    <AbstractDQ_Completeness·group="exhaustivity"·valueType="Real">0.6</AbstractDQ_Completeness>  
    <DQ_CompletenessCommission·group="exhaustivity"·valueType="Real">0.6</DQ_CompletenessCommission>  
    <!--Logical-->  
    <DQ_ConceptualConsistency·group="logicalConsistency"·valueType="Real">0.2</DQ_ConceptualConsistency>  
    <DQ_DataQuality·group="logicalConsistency"·valueType="Real">0.2</DQ_DataQuality>  
    <DQ_FormatConsistency·group="logicalConsistency"·valueType="Real">0.2</DQ_FormatConsistency>  
    <AbstractDQ_LogicalConsistency·group="logicalConsistency"·valueType="Real">0.2</AbstractDQ_LogicalConsistency>
```

report-19157.xml

# Le POC précédent

## My Dataset

Date de création : 2020-09-29  
Date de publication : 2020-10-19  
Date de révision : 2020-11-02

### User Advice

note ★★★★★

#### Details

exhaustivity ★★★★★

logicalConsistency ★★★★★

positionAccuracy ★★★★★

thematicAccuracy ★★★★★

temporalAccuracy ★★★★★

spatialAccuracy ★★★★★

usability ★★★★★

### Dataset quality metrics

exhaustivity ★★★★★

logicalConsistency ★★★★★

### Dataset quality metrics

exhaustivity ★★★★★

logicalConsistency ★★★★★

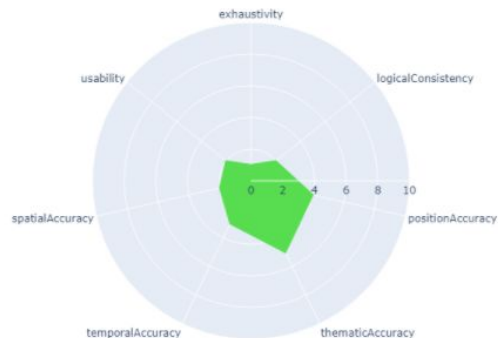
positionAccuracy ★★★★★

thematicAccuracy ★★★★★

temporalAccuracy ★★★★★

spatialAccuracy ★★★★★

usability ★★★★★



# Objectif

S'appuyer sur un vrai fichier XML ISO-19157

# Le fichier XML d'exemple

Fichier XML transmis par Marie Lambois, IGN

**fake-dng2.0-iso.xml**



# Informations générales

This XML file does not appear to have any style information associated with it. The document tree is shown below:

```
<?xml version="1.0" encoding="UTF-8" ?>
<gmd:MD_Metadata xmlns:egco="urn:dgiwg:xmlns:dmf:1.0:iso-gl:egco" xmlns:gco="http://www.isotc211.org/2005/gco" xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:gml="http://www.isotc211.org/2003/gml" xmlns:gnames="http://www.opengis.net/gml/3.2" xmlns:gmw="http://www.isotc211.org/2005/gmw" xmlns:mf="http://eden.ign.fr/xsd/metafor/20130116/mf" xmlns:ngmp="urn:int:nato:geometo:geo:metadat:dng:xmlns:dng:2.0:canonic:sgl" xmlns:sgp="urn:X-dng:xmlns:dng:2.0:canonic:sgp" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.isotc211.org/2005/gmd http://www.isotc211.org/2005/gmd.xsd" ?>
  <gmd:fileIdentifier>
    <gco:CharacterString>mdid_AD</gco:CharacterString>
  </gmd:fileIdentifier>
  <gmd:language>
    <gmd:LanguageCode codeList="urn:dgiwg:metadata:dmf:1.0:codelist#LanguageCode" codeListValue="eng">English</gmd:LanguageCode>
  </gmd:language>
  <gmd:characterSet>
    <gmd:MD_CharacterSetCode codeList="urn:dgiwg:metadata:dmf:1.0:codelist#MD_CharacterSetCode" codeListValue="utf8">utf8</gmd:MD_CharacterSetCode>
  </gmd:characterSet>
  <gmd:hierarchyLevel>
    <gmx:MX_ScopeCode codeList="urn:dgiwg:metadata:dmf:1.0:codelist#MX_ScopeCode" codeListValue="dataset">Dataset</gmx:MX_ScopeCode>
  </gmd:hierarchyLevel>
  <gmd:hierarchyLevelName>
    <gco:CharacterString>Elementary Product</gco:CharacterString>
  </gmd:hierarchyLevelName>
  <gmd:contact>
    <gmd:CI_ResponsibleParty>
      <gmd:organisationName>
        <gco:CharacterString>EGI</gco:CharacterString>
      </gmd:organisationName>
      <gmd:contactInfo>
        <gmd:CI_Contact>
          <gmd:phone>
            <gmd:CI_Telephone>
              <gmd:voice>
                <gco:CharacterString>+ 33 (0)344287557</gco:CharacterString>
              </gmd:voice>
            </gmd:CI_Telephone>
            <gmd:facsimile>
              <gco:CharacterString>+33 (0)344286357</gco:CharacterString>
            </gmd:facsimile>
          </gmd:phone>
          <gmd:address>
            <gmd:CI_Address>
              <gmd:deliveryPoint>
                <gco:CharacterString>BA 110</gco:CharacterString>
              </gmd:deliveryPoint>
              <gmd:city>
                <gco:CharacterString>CREIL cedex</gco:CharacterString>
              </gmd:city>
              <gmd:postalCode>
                <gco:CharacterString>60314</gco:CharacterString>
              </gmd:postalCode>
              <gmd:electronicMailAddress>
                <gco:CharacterString>EMA.EGI-CREIL.contact-clients@intradef.gouv.fr</gco:CharacterString>
              </gmd:electronicMailAddress>
            </gmd:CI_Address>
          </gmd:address>
        </gmd:CI_Contact>
      </gmd:contactInfo>
      <gmd:role>
        <gmd:CI_RoleCode codeList="urn:dgiwg:metadata:dmf:1.0:codelist#CI_RoleCode" codeListValue="pointOfContact">Point of contact</gmd:CI_RoleCode>
      </gmd:role>
    </gmd:CI_ResponsibleParty>
  </gmd:contact>

```

# Analyse du XML

Nombre de noeuds : **1553**

Nombre de noeuds avec des valeurs présentes : **979**

# Les noeuds racines

```
'fileIdentifier' // mdid_AD
'language' // English
'characterSet' // utf8
'hierarchyLevel' // Dataset
'hierarchyLevelName' // Elementary Product
'contact' // phone, role, address, ...
'contact'
'dateStamp' // 2015-06-03
'metadataStandardName' // ISO 19115
'metadataStandardVersion' // 1.0
'spatialRepresentationInfo' // resolution, dimension, dimensionSize,
cellSize, ...
'referenceSystemInfo' // WGS84G
'identificationInfo' // title (ORTHO IMAGE Level 4 single product on
Chad, date, ...
'contentInfo' // MD_Band (red), bitsPerValue, ...
''dataQualityInfo'
''dataQualityInfo'
''dataQualityInfo'
''dataQualityInfo'
''dataQualityInfo'
'metadataConstraints' // D_ClassificationCode
```

# DataQualityInfo

```
</gmd:referenceSystemInfo>
▶<gmd:identificationInfo>
  ...
  </gmd:identificationInfo>
▶<gmd:contentInfo>
  ...
  </gmd:contentInfo>
▶<gmd:dataQualityInfo>
  ...
  </gmd:dataQualityInfo>
▶<gmd:dataQualityInfo>
  ...
  </gmd:dataQualityInfo>
▶<gmd:dataQualityInfo>
  ...
  </gmd:dataQualityInfo>
▼<gmd:dataQualityInfo>
  ▼<gmd:DQ_DataQuality>
    ▼<gmd:scope>
      ▼<gmd:DQ_Scope>
        ▼<gmd:level>
          <gmx:MX_ScopeCode codeList="urn:dgiwg:metadata:dmf:1.0:codelist#MX_ScopeCode" codeListValue="dataset">Dataset</gmx:MX_ScopeCode>
          </gmd:level>
        </gmd:DQ_Scope>
      </gmd:scope>
    ▼<gmd:report>
      ▼<gmi:QE_Usability>
        ▼<gmd:nameOfMeasure xsi:type="gmd:PT_FreeText_PropertyType">
          <gco:CharacterString>Absolute precision mask</gco:CharacterString>
        ▼<gmd:PT_FreeText>
          ▼<gmd:textGroup>
            <gmd:LocalisedCharacterString locale="#locale-fra">Masque de précision planimétrique absolue</gmd:LocalisedCharacterString>
          </gmd:textGroup>
        </gmi:QE_Usability>
      </gmd:report>
    </gmd:DQ_DataQuality>
  </gmd:dataQualityInfo>
</gmd:dataQualityInfo>
```

```
<gmd:dataQualityInfo>
  <gmd:DQ_DataQuality>
    <gmd:scope>
      <gmd:DQ_Scope>
        <gmd:level>
          <gmx:MX_ScopeCode codeList="urn:dgiwg:metadata:dmf:1.0:codelist#MX_ScopeCode" codeListValue="dataset">Dataset</gmx:MX_ScopeCode>
        </gmd:level>
      </gmd:DQ_Scope>
    </gmd:scope>
    <gmd:report>
      <gmd:DQ_AbsoluteExternalPositionalAccuracy>
        <gmd:nameOfMeasure xsi:type="gmd:PT_FreeText_PropertyType">
          <gco:CharacterString>Synthetic expression of the horizontal quality</gco:CharacterString>
        </gmd:PT_FreeText>
        <gmd:textGroup>
          <gmd:LocalisedCharacterString locale="#locale-fra">Indication synthétique de la qualité planimétrique</gmd:LocalisedCharacterString>
        </gmd:textGroup>
      </gmd:PT_FreeText>
    </gmd:nameOfMeasure>
    <gmd:measureIdentification>
      <gmd:RS_Identifier>
        <gmd:code>
          <gco:CharacterString>PACC</gco:CharacterString>
        </gmd:code>
        <gmd:codeSpace>
          <gco:CharacterString>CARGENE_v10</gco:CharacterString>
        </gmd:codeSpace>
      </gmd:RS_Identifier>
    </gmd:measureIdentification>
    <gmd:measureDescription xsi:type="gmd:PT_FreeText_PropertyType">
      <gco:CharacterString>Absolute horizontal accuracy of the resource expressed using the codes defined in STANAG 2215</gco:CharacterString>
    </gmd:PT_FreeText>
    <gmd:textGroup>
      <gmd:LocalisedCharacterString locale="#locale-fra">Expression de la précision planimétrique absolue de la ressource suivant la codification proposée par le STANAG 2215</gmd:LocalisedCharacterString>
    </gmd:textGroup>
  </gmd:measureDescription>
  <gmd:result>
    <gmd:DQ_QuantitativeResult>
      <gmd:valueType>
        <gco:RecordType xlink:href="urn:dgiwg:metadata:dmf:1.0:xmlns:w3:XMLSchema:2001:string"/>
      </gmd:valueType>
      <gmd:valueUnit gco:nilReason="inapplicable"/>
      <gmd:value>
        <gco:Record xsi:type="xs:string">C</gco:Record>
      </gmd:value>
    </gmd:DQ_QuantitativeResult>
  </gmd:result>
</gmd:DQ_AbsoluteExternalPositionalAccuracy>
</gmd:report>
<gmd:report>
  <gmd:DQ_AbsoluteExternalPositionalAccuracy>
    <gmd:nameOfMeasure xsi:type="gmd:PT_FreeText_PropertyType">
      <gco:CharacterString>Synthetic expression of the vertical quality</gco:CharacterString>
    </gmd:PT_FreeText>
    <gmd:textGroup>
      <gmd:LocalisedCharacterString locale="#locale-fra">Indication synthétique de la qualité altimétrique</gmd:LocalisedCharacterString>
    </gmd:textGroup>
  </gmd:PT_FreeText>
</gmd:report>
```

# Le rendu (pour le moment)

Essayer de  
matcher le plus  
possible avec  
les champs du  
XML

## ORTHO IMAGE Level 4 single product on Chad

Date : 2015-06-03

This product provides pansharpened orthorectified images made from PLEIADES 1A and PLEIADES 1B satellite images.

**Indication synthétique de la qualité planimétrique (DQ\_AbsoluteExternalPositionalAccuracy)**

C

**Indication synthétique de la qualité altimétrique (DQ\_AbsoluteExternalPositionalAccuracy)**

4

**Indication synthétique de fidélité (QE\_Usability)**

NC

**Objet qualité linéaire (QE\_Usability)**

Discontinuity nature over the line

**Image des zones de qualité planimétrique homogène (QE\_Usability)**

index canal

# Exécution

```
C:\python\python quadorender-19157.py fake-dng2.0-iso.xml
```

# Questions

Un dictionnaire ou des clés d'interprétation du XML ?

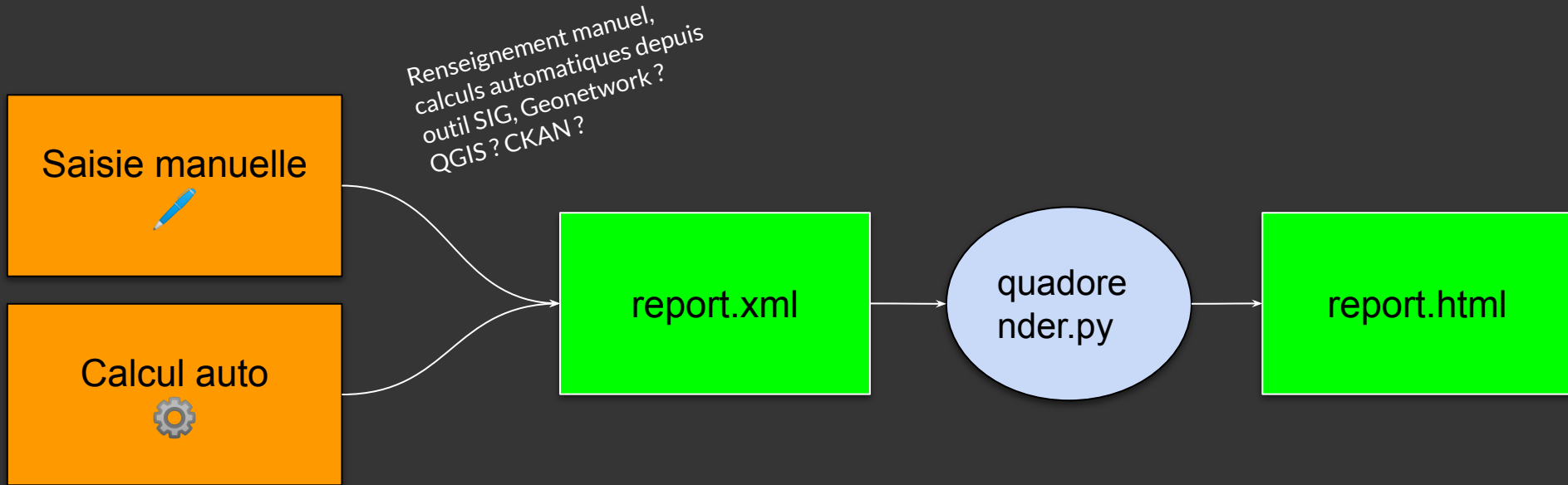
Des registres de valeurs pour certaines mesures ?

Indication synthétique de la qualité planimétrique (DQ\_AbsoluteExternalPositionalAccuracy)

c



# Remontée qualité



# Remontée utilisateur

Saisie manuelle



## User Advice

note ★★★★★

### Details

exhaustivity ★★★★★

logicalConsistency ★★★★★

positionAccuracy ★★★★★

thematicAccuracy ★★★★★

temporalAccuracy ★★★★★

spatialAccuracy ★★★★★

usability ★★★★★

# Calcul auto

Calcul auto



*Avec spécifications*

```
C:\Python39\Scripts\frictionless validate --schema schema.json exemple-valide.csv
```

Calcul auto (géo)



*Avec ou sans spécifications*

```
from qgis.core import ...  
from grass.pygrass.modules import ...
```

# Après

Essayer d'enrichir le rendu avec de nouvelles informations (graphiques, etc...)

Un traducteur vers la version **simplifiée** Quadogeo (modèle d'Arnaud)

<https://gitlab.cerema.fr/mathieu.rajerison/quadogeo/>