UN-GGIM
General presentation

UN-GGIM (United Nations initiative on Global Geospatial Information Management)

- Objectives

  - **coordination forum between Member States on Geographic Information**

  - For the Sustainable Development Goals

Unleashing the power of 'Where' ....

... to make the world a better place.

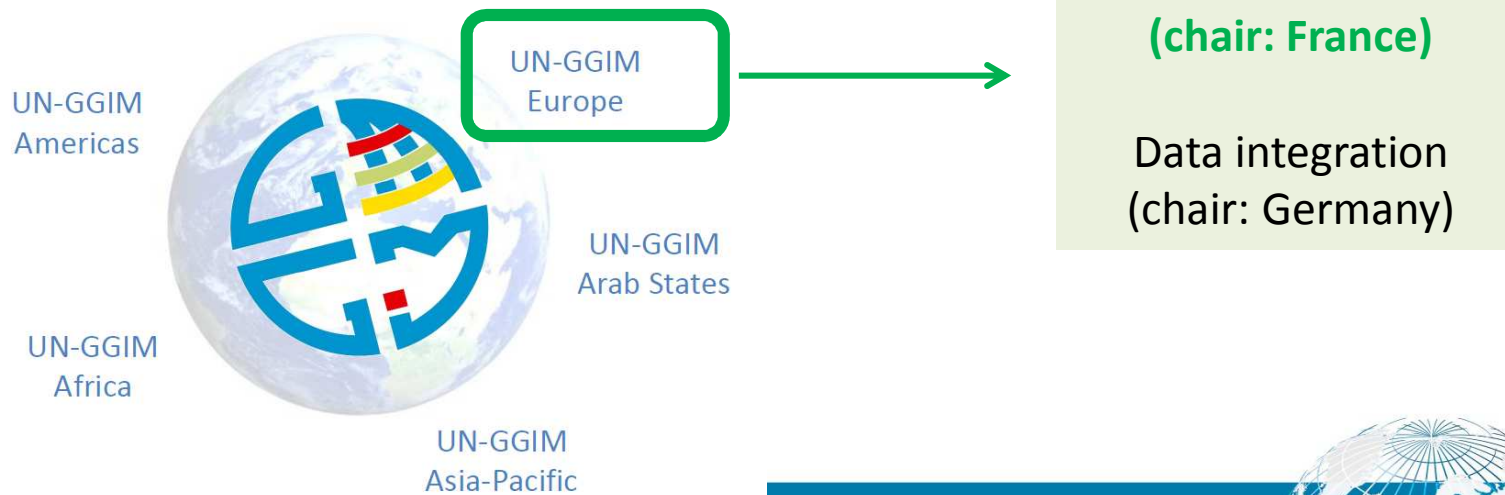# UN-GGIM

- Organisation
  - Activities at global level global
    - Global Geodetic Reference Framework
    - Cadaster – land administration
    - National Institutional Arrangements
    - Fundamental data
    - …..

  Depuis 2011

  Strong involvement of statistical community

  - activities at regional level (since 2014)

UN-GGIM Americas

UN-GGIM Europe

Core data (chair: France)

Data integration (chair: Germany)

UN-GGIM Arab States

UN-GGIM Africa

UN-GGIM Asia-Pacific

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Core data concepts

Core data definition

- Core data is
  - Geographic data
  - The most useful to analyse, achieve and monitor the SDG (Sustainable Development Goals)
    - Either directly or indirectly (background map, link with other data)
    - Common requirements to all countries

Common requirements => commun content

Sustainable Development Goals

- For 2015 - 2030

Objectives of core data

- Define **priorities** for production of new data or for enhancement of existing data

- Recommendations for politic deciders and for data producers

Core data and INSPIRE

- Wider context

Core data context :
the 3 pillars of Sustainable Development
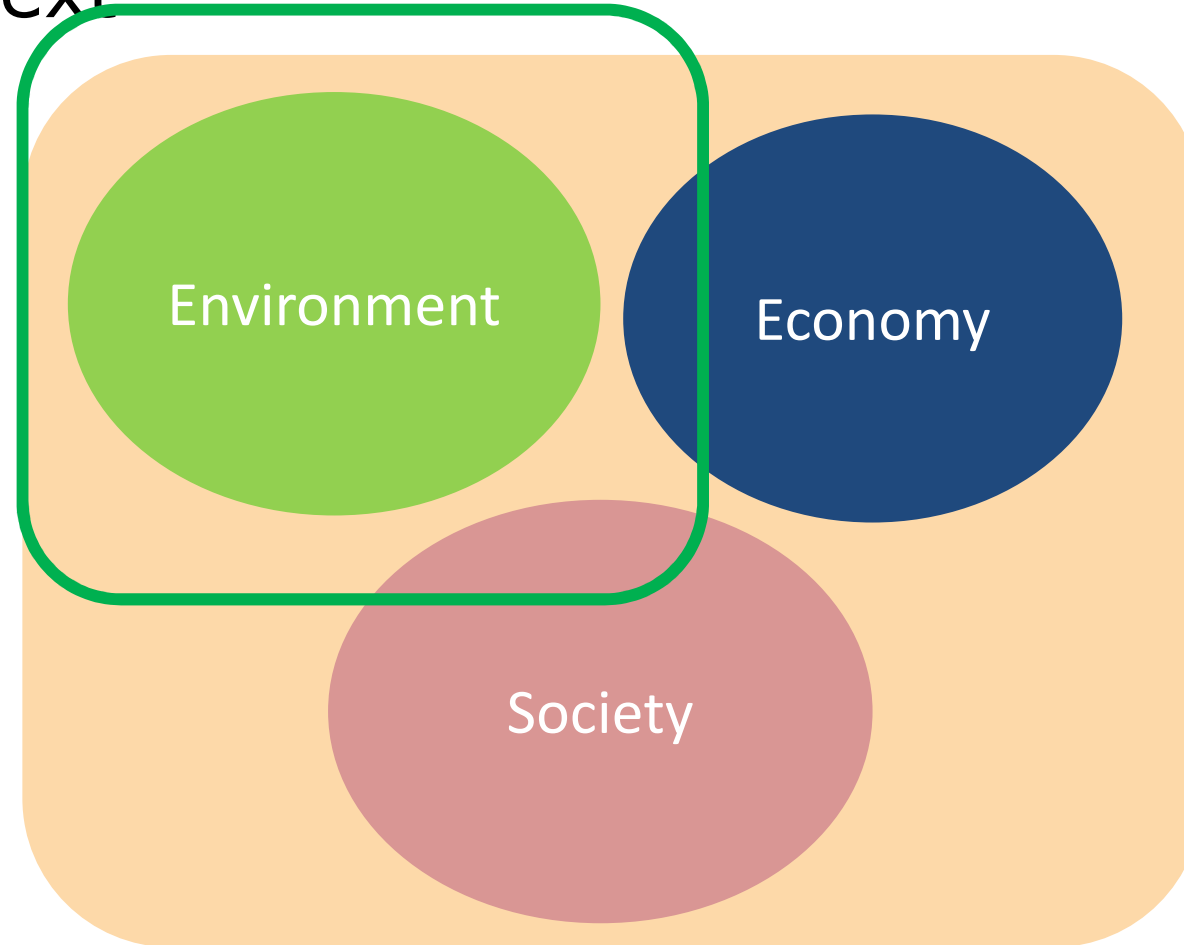
Environment

Economy

Society

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Core data and INSPIRE

- Different ambitions

  INSPIRE: STRUCTURE

  CORE DATA: CONTENT

  - INSPIRE
    - Exchange data models and formats
  - Core data
    - Minimum common content
    - At well defined levels of detail
    - Minimum quality requirements

- Core data deliverable : "Recommendations for content"

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Core data and INSPIRE

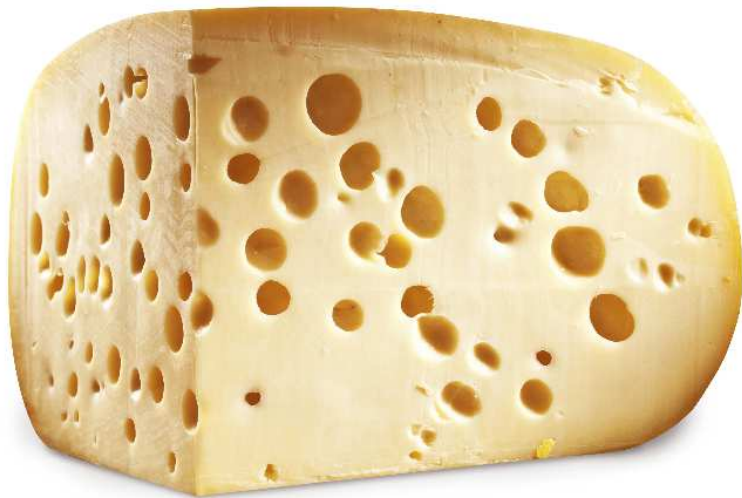
The INSPIRE big cheese
with lots of holes

Users begin to complain:
not so much to eat!

The core data cheese:
smaller but compact
and really filled

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INSPIRE profiles for core data

Core data themes

Annex I

Coordinate Reference Systems

Geographical Grid Systems

Geographical Names

Administrative Units

Addresses

Cadastral Parcels

Transport Networks

Hydrography

Protected Sites

Annex II

Elevation

Land Cover

OrthoImagery

Geology

Annex III

Statistical units

Buildings

Soil

Land use

Human health and safety

Utility and governmental services

Environmental monitoring facilities

Production and industrial facilities

Agricultural and aquaculture facilities

Population distribution - demography

Area management/restriction/regulation

Natural risk zones

Atmospheric conditions

Meteorological geographical features

Oceanographic geographical features

Sea regions

Bio-geographical regions

Habitats and biotopes

Species distribution

Energy resources

Mineral resources

General approach

- Based both on

    – User requirements

        – With focus on SDG

    – Standards :

        – Mainly the INSPIRE data models

INSPIRE offers common terminology, common starting point

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General approach

- Deliverables are first for deciders

  - Describe expected content in text

  - Avoid too technical language

- Deliverables are also for future implementers

  - Show the relation (difference and similarities) with INSPIRE data models

  - In an annex

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Adaptations of INSPIRE data models

- Guiding principles:

  - Keep as close as possible to INSPIRE

  - Avoid to make new data models if it can be avoided

  - Core data UML models are just illustrations, images

    - To help better understanding of what is expected

    - Communication tool within the WG and for audience

  - Models won't be supplied as resources to derive feature catalogues or GML schema

  - No maintenance of core data "models" is expected.

Adaptations of INSPIRE data models

- Simple cases:

  - **Display the core features types and attributes**

    - Most frequent case

  - Include additional information if key user requirements

    - Exceptions

- Done for 3 themes: CP, AD, GN

Adaptations of INSPIRE data models

- How to document these adaptations?

  - **Display the core feature types and attributes**

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Adaptations of INSPIRE data models

- How to document these adaptations?

  – additional information if key user requirements

Formal extension of INSPIRE data model according the rules of Generic Conceptual Model
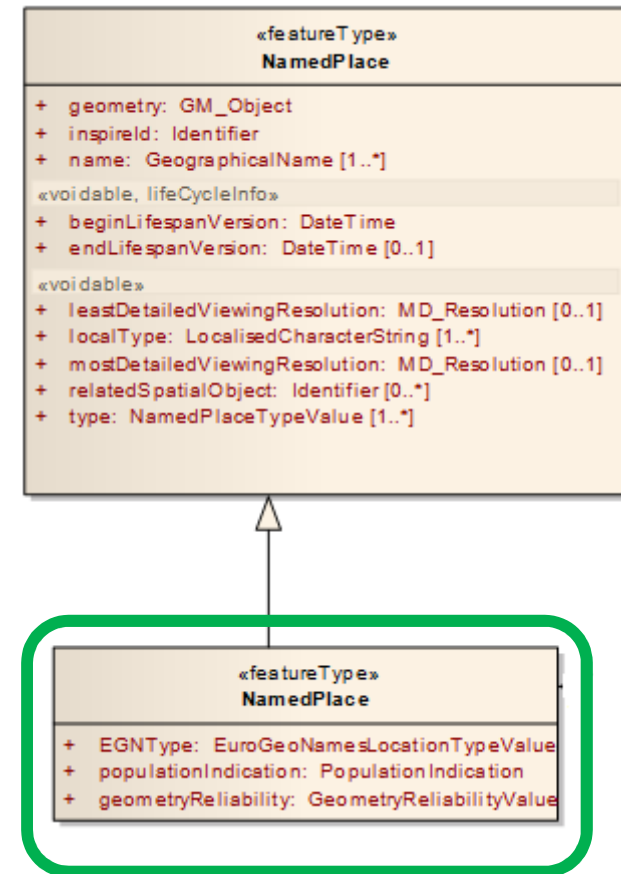
Child feature type carrying the additional attributes

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Adaptations of INSPIRE data models

- Complex cases :

    - More difficulties expected on some other themes

    - No decision taken yet

    - But some draft ideas

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Adaptations of INSPIRE data models

- Complex cases :

  – Non-extensible code lists

class Core Administrative and Social Governmental Serv...

«featureType»
GovernmentalService

+ inspireId: Identifier
+ serviceLocation: serviceLocationType
+ serviceType: ServiceTypeValue

«voidable»
+ areaOfResponsibility: AreaOfResponsibilityType [0..1]
+ pointOfContact: Contact [1..*]

«lifeCycleInfo, voidable»
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]

The INSPIRE code list is not extensible and is limited to the governmental services required by environmental use cases.

For core data, we need all the governmental services that are of interest for the SDG.
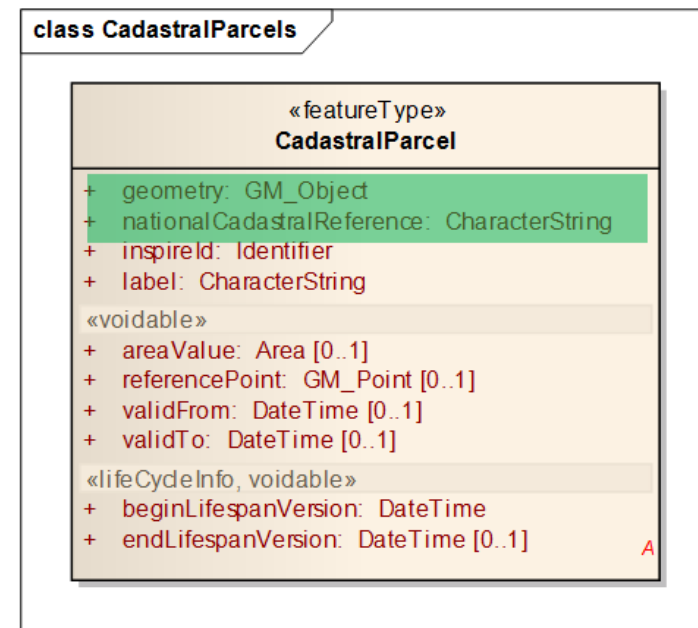
Potential solution: keep attribute name but not attribute type

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Adaptations of INSPIRE data models

- Complex cases :

  - Generalisation/specialisation

  - Case of theme Transport Networks

  - Very generic data model in INSPIRE

    - 3 levels of inheritance: network, transport, road/railway/air/water/cable

    - Common Transport Properties

    - Specific Properties for each kind of transport (road, railway, air, water, cable)

    - Properties may apply to any feature type (node, link, link set, …)

Adaptations of INSPIRE data models

- Complex cases :

  - Generalisation/specialisation

  - Case of theme Transport Networks

  - Potential example of core data

    - Road node with name, form of node

    - Road Link with name, form of way and vertical position

    + geometry and identifier
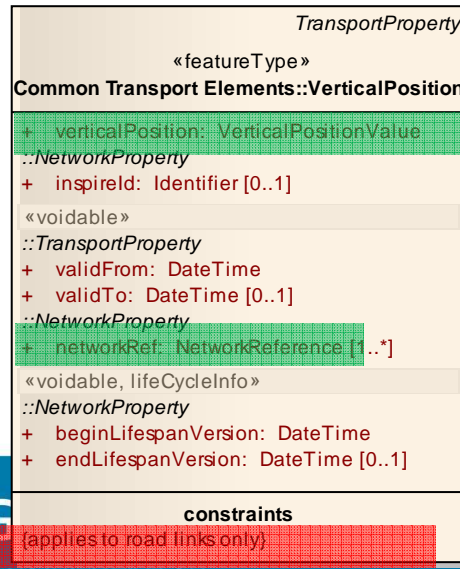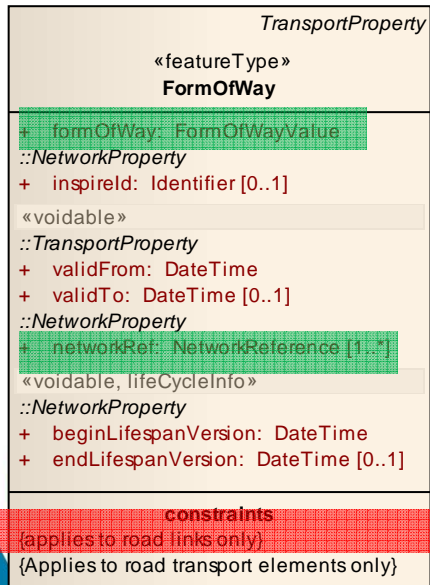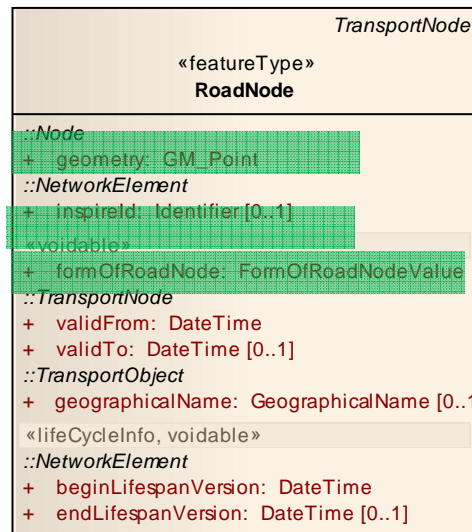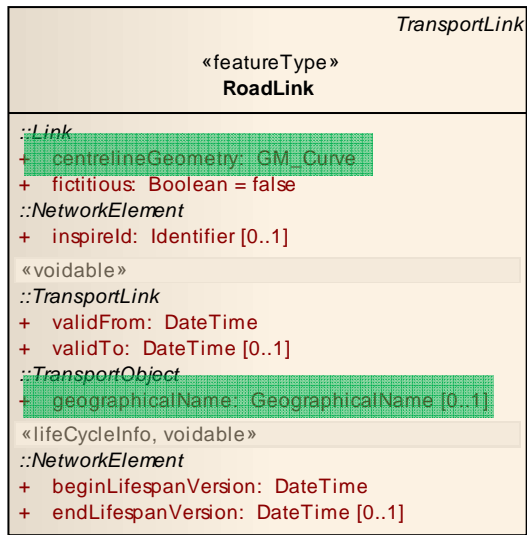
class Road core INSPIRE

TransportLink

«featureType»
RoadLink

::Link
+ centrelineGeometry: GM_Curve
+ fictitious: Boolean = false
::NetworkElement
+ inspireId: Identifier [0..1]

«voidable»
::TransportLink
+ validFrom: DateTime
+ validTo: DateTime [0..1]
::TransportObject
+ geographicalName: GeographicalName [0..1]

«lifeCycleInfo, voidable»
::NetworkElement
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]

TransportNode

«featureType»
RoadNode

::Node
+ geometry: GM_Point
::NetworkElement
+ inspireId: Identifier [0..1]

«voidable»
+ formOfRoadNode: FormOfRoadNodeValue
::TransportNode
+ validFrom: DateTime
+ validTo: DateTime [0..1]
::TransportObject
+ geographicalName: GeographicalName [0..1]

«lifeCycleInfo, voidable»
::NetworkElement
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]

TransportProperty

«featureType»
FormOfWay

+ formOfWay: FormOfWayValue
::NetworkProperty
+ inspireId: Identifier [0..1]

«voidable»
::TransportProperty
+ validFrom: DateTime
+ validTo: DateTime [0..1]
::NetworkProperty
+ networkRef: NetworkReference [1..*]

«voidable, lifeCycleInfo»
::NetworkProperty
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]

constraints
(applies to road links only)
{Applies to road transport elements only}

TransportProperty

«featureType»
Common Transport Elements::VerticalPosition

+ verticalPosition: VerticalPositionValue
::NetworkProperty
+ inspireId: Identifier [0..1]

«voidable»
::TransportProperty
+ validFrom: DateTime
+ validTo: DateTime [0..1]
::NetworkProperty
+ networkRef: NetworkReference [1..*]

«voidable, lifeCycleInfo»
::NetworkProperty
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]

constraints
(applies to road links only)

It would be possible to document it using the rules of Generic Conceptual Model (by adding constraints)

But result is not very readable!

class Road Transport core WG A

«feature type»
RoadLink

+ centrelineGeometry: GM_Curve
+ inspireId: Identifier
+ name: GeographicalName [0..*]
+ verticalPosition: VerticalPositionValue
+ formOfWay: FormOfWayValue

«feature type»
RoadNode

+ geometry: GM_Point
+ inspireId: Identifier
+ formOfNode: FormOfRoadNodeValue
+ name: GeographicalName [0..*]

It might be worth to make a specific core data model.
Relation with INSPIRE just by using same concepts (attribute names and types)

Adaptations of INSPIRE data models

- Complex cases :

  - Merging application schemas

  - Case of theme Hydrography

  - INSPIRE is about specifications for delivery

    - Several views => several application schemas (PhysicalWaters, HydroNetwork)

  - Core data is about recommendation for production

    - From a single production data base, it is possible to derive:

      - INSPIRE physicalWaters

      - INSPIRE HydroNetwork

      - Partly INSPIRE WaterTransportNetwork (navigable watercourses)

Adaptations of INSPIRE data models

- Complex cases :

    - Merging application schemas

    - Case of theme Hydrography

    - Likely, we'll have to design a specific core data model

        - Same principle as for French hydrographic database

        - Differences

            - with simpler "core" content

            - Without other adaptations from INSPIRE

Adaptations of INSPIRE data models

- Complex cases :

  - No content in INSPIRE data model

  - Case of coverage themes Elevation and Orthoimagery

  - Data models are mainly for delivery by WCS

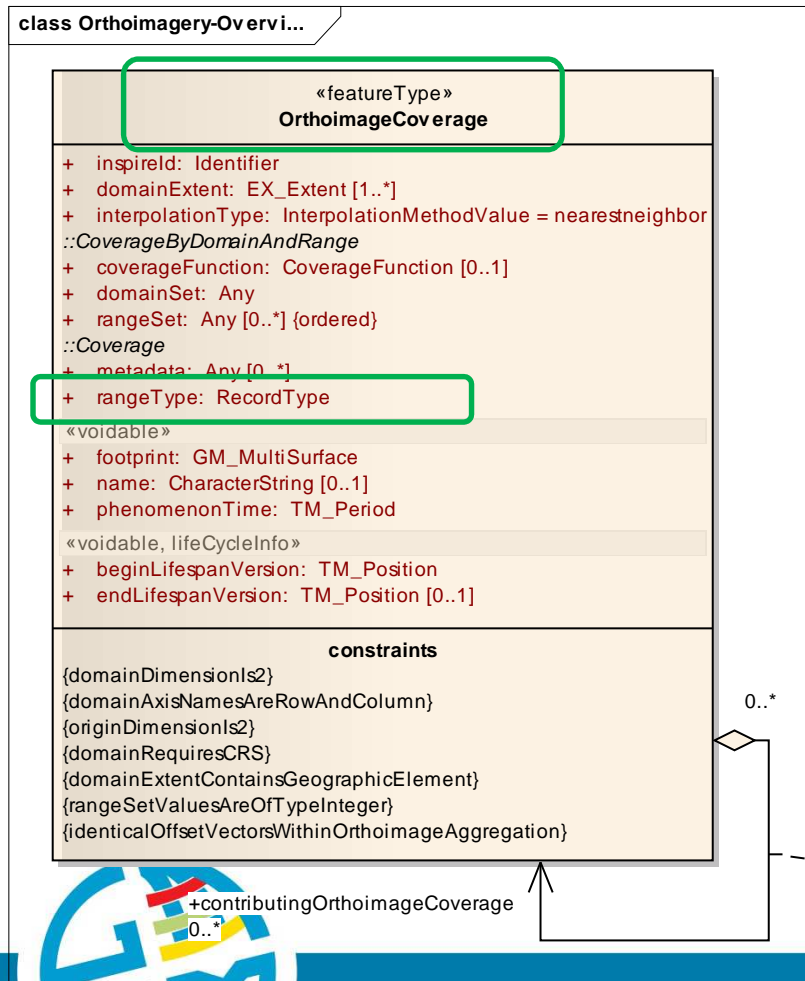 - Very limited information about expected content

Adaptations of INSPIRE data models

class Orthoimagery-Overvi...

```
                    «featureType»
                 OrthoimageCoverage

+   inspireId:  Identifier
+   domainExtent:  EX_Extent [1..*]
+   interpolationType:  InterpolationMethodValue = nearestneighbor
::CoverageByDomainAndRange
+   coverageFunction:  CoverageFunction [0..1]
+   domainSet:  Any
+   rangeSet:  Any [0..*] {ordered}
::Coverage
+   metadata: Any [0..*]
+   rangeType:  RecordType
«voidable»
+   footprint:  GM_MultiSurface
+   name:  CharacterString [0..1]
+   phenomenonTime:  TM_Period
«voidable, lifeCycleInfo»
+   beginLifespanVersion:  TM_Position
+   endLifespanVersion:  TM_Position [0..1]

                    constraints
{domainDimensionIs2}
{domainAxisNamesAreRowAndColumn}
{originDimensionIs2}
{domainRequiresCRS}
{domainExtentContainsGeographicElement}
{rangeSetValuesAreOfTypeInteger}
{identicalOffsetVectorsWithinOrthoimageAggregation}
```

0..*

+contributingOrthoimageCoverage

0..*

Almost no information about expected content in INSPIRE model

Potential solution: no UML model at all for core data

Coverage UML models are not helping good understanding.

Adaptations of INSPIRE data models

- Complex cases :

    – No content in INSPIRE data model

    – Case of theme Land Cover

    – No common classification

    – Big issue for core data

        - Not for UML modeling

        - But for decision making : lack of starting point

Conclusions

Validation

- Core data recommendation for content:

  – Through review by geo-statistic community

  – Same methodology as INSPIRE

- Core data

  – No validation expected

  – Only recommendations, not obligations

Conclusion

- Core data initiative wouldn't be possible without INSPIRE

    - Common terminology

    - Very good starting point for most themes

- But adaptations are required

    – Wider context: some extensions

    – Limited ambition (core): selection of priority features and attributes

    – Production oriented: redesign may be required

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