

WORKSHOP

L'implementazione della Direttiva
INSPIRE: applicazioni nel contesto
europeo

**Approccio dei progetti
all'armonizzazione e validazione
dei dati
secondo la Direttiva INSPIRE**

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Sommario

- Un approccio comune per l'armonizzazione e validazione di dati e metadati in conformità ad INSPIRE
- Identificazione dello schema target per la trasformazione
- Le mapping tables
- I software di trasformazione dati
- La validazione dei dati: dalle ATS alle ETS

Un approccio comune ...

- Una caratterizzazione strutturata e dettagliata degli Use Cases
- Continue interazioni con i pilots
- Un'analisi approfondita della documentazione INSPIRE
- La condivisione di procedure e tools efficaci
- Tanta buona volontà ...

Lo schema target

■ eENVplus:

- AU, HY, TN, PS
- GE, LC
- LU, BR, HB, SD, NZ, US
- AQD
- GeoSciML



INSPIRE
Infrastructure for Spatial Information in Europe

D2.8.1.4 Data Specification on Administrative Units – Technical Guidelines

■ LIFE+IMAGINE:

- GE, LC
- NZ, SU, PD

■ GeoSmartCity:

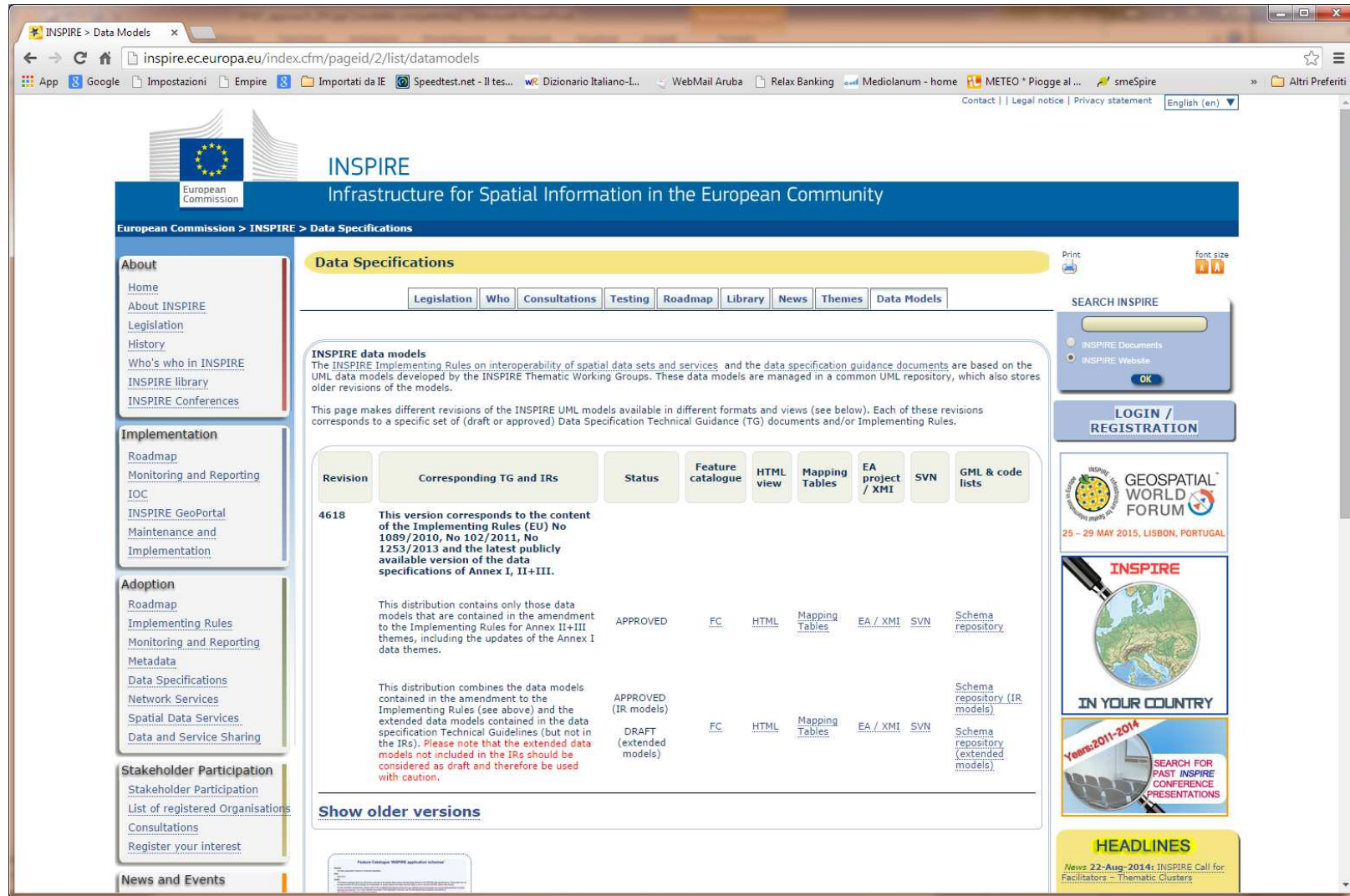
- US, BU
- CityGML, ADE

Title	D2.8.1.2 Data Specification on <i>Administrative Units</i> – Technical Guidelines
Creator	INSPIRE Thematic Working Group Administrative Units
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Source	
Rights	Public
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Language	En

Lo schema target

- Non basta indentificare il tema INSPIRE, in quanto occorre identificare l'xsd target
- 34 temi → oltre 100 xsd:
 - LC vector/raster
 - diversi xsd per TN (road, railways, air, ...)
 - diversi xsd per US (electricity, oil-gas-chemicals, sewer, water, telecommunications, ...)
 - ...

Lo schema target



The screenshot shows the INSPIRE Data Specifications page. The header includes the European Commission logo and the INSPIRE title. The main content area is titled 'Data Specifications' and contains a table of revisions. The table has columns for Revision, Corresponding TG and IRs, Status, Feature catalogue, HTML view, Mapping Tables, EA project / XMI, SVN, and GML & code lists. The first row shows revision 4618, which corresponds to the content of the Implementing Rules (EU) No 1089/2010, No 102/2011, No 1253/2013 and the latest publicly available version of the data specifications of Annex I, II+III. The table also includes links for 'Show older versions' and 'HEADLINES'.

Revision	Corresponding TG and IRs	Status	Feature catalogue	HTML view	Mapping Tables	EA project / XMI	SVN	GML & code lists
4618	This version corresponds to the content of the Implementing Rules (EU) No 1089/2010, No 102/2011, No 1253/2013 and the latest publicly available version of the data specifications of Annex I, II+III.	APPROVED	FC	HTML	Mapping Tables	EA / XMI	SVN	Schema repository
	This distribution contains only those data models that are contained in the amendment to the Implementing Rules for Annex II+III themes, including the updates of the Annex I data themes.	APPROVED (IR models)	FC	HTML	Mapping Tables	EA / XMI	SVN	Schema repository (IR models)
	This distribution combines the data models contained in the amendment to the Implementing Rules (see above) and the extended data models contained in the data specification Technical Guidelines (but not in the IRs). Please note that the extended data models not included in the IRs should be considered as draft and therefore be used with caution.	DRAFT (extended models)	FC	HTML	Mapping Tables	EA / XMI	SVN	Schema repository (extended models)

[Show older versions](#)

HEADLINES
News 22-Aug-2014: INSPIRE Call for Facilitators - Thematic Clusters

Le mapping tables

Application Schema 'AdministrativeUnits' (version 3.0)							Application Schema <provide						
Type	Documentation	Attribute / Association role / Constraint	Attribute / Association role / Constraint	Values / Enumerations	Multiplicity	Voidable / Non-Voidable	Type	Documentation	Attribute / Association role / Constraint	Attribute / Association role / Constraint	Value Enumerations		
AdministrativeBoundary	-- Name -- administrative boundary A line of demarcation between administrative units.	beginLifespanVersion	-- Name -- begin lifespan version	DateTime	1	voidable							
		country	-- Name -- country	CountryCode* BE*	1								
		endLifespanVersion	-- Name -- end lifespan version	DateTime	0..1	voidable							
		geometry	-- Name -- geometry	GM_Curve	1								
		inspireId	-- Name -- inspire id	Identifier	1								
		legalStatus	-- Name -- legal status	LegalStatusValue*	1	voidable							
		nationalLevel	-- Name -- national level	AdministrativeHierarchyLevel*	1..6								
		technicalStatus	-- Name -- technical status	TechnicalStatusValue*	1	voidable							
		admUnit	-- Name -- adm unit	AdministrativeUnit	1..*	voidable							
AdministrativeUnit	-- Name -- administrative unit Unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.	beginLifespanVersion	-- Name -- begin lifespan version	DateTime	1	voidable							
		country	-- Name -- country	CountryCode* BE*	1								
		endLifespanVersion	-- Name -- end lifespan version	DateTime	0..1	voidable							
		geometry	-- Name -- geometry	GM_MultiSurface	1								
		inspireId	-- Name -- inspire id	Identifier	1								
		name	-- Name -- name	GeographicalName	1..*								
		nationalCode	-- Name -- national code	CharacterString	1								
		nationalLevel	-- Name -- national level	AdministrativeHierarchyLevel*	1								
		nationalLevelName	-- Name -- national level	LocalisedCharacterString	1..*	voidable							
		residenceOfAuthority	-- Name -- residence of authority	ResidenceOfAuthority	1..*	voidable							
		condominium	-- Name -- condominium	Condominium	0..*	voidable							
		boundary	-- Name -- boundary	AdministrativeBoundary	1..*	voidable							
		lowerLevelUnit	-- Name -- lower level unit	AdministrativeUnit	0..*	voidable							
		upperLevelUnit	-- Name -- upper level unit	AdministrativeUnit	0..1	voidable							
		administeredBy	-- Name -- administered by	AdministrativeUnit	0..*	voidable							
		coAdminister	-- Name -- co-administer	AdministrativeUnit	0..*	voidable							
ResidenceOfAuthority	Data type representing the name and position of a residence of authority.	name	Name of the residence	GeographicalName	1								
		geometry	Position of the residence of authority	GM_Point	1	voidable							
Condominium	-- Name -- condominium An administrative area established independently to any national administrative division of territory and administered by two or more countries NOTE: Condominium is not a part of any national	beginLifespanVersion	-- Name -- begin lifespan version	DateTime	1	voidable							
		endLifespanVersion	-- Name -- end lifespan version	DateTime	0..1	voidable							
		geometry	-- Name -- geometry	GM_MultiSurface	1								
		inspireId	-- Name -- inspire id	Identifier	1								
		name	-- Name -- name	GeographicalName	0..*	voidable							
		admUnit	-- Name -- adm unit	AdministrativeUnit	1..*	voidable							

Le mapping tables

14	AdministrativeUnit	-- Name -- administrative unit Unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.				
15			beginLifespanVersion	-- Name -- begin lifespan version Date and time	DateTime	1
16			country	-- Name -- country Two character country code	CountryCode* BE* BG* CZ* DK* DE* EE*	1
17			endLifespanVersion	-- Name -- end lifespan version Date and time	DateTime	0..1
18			geometry	-- Name -- geometry	GM_MultiSurface	1
19			inspireId	-- Name -- inspire id	Identifier	1
20			name	-- Name -- name Official name	GeographicalName	1..*

A	B	C	D	E	F	G
Application Schema 'Base Types' (version 3.3rc3)						
Type	Documentation	Attribute Association role / Constraint	Attribute / Association role / Constraint	Values / Enumerations	Multiplicity	Voidable / Non-Voidable
SpatialDataSet	Identifiable collection of spatial data. NOTE The type SpatialDataSet is offered as a pre-defined type for spatial data sets	identifier	Identifier of the spatial data set	Identifier	1	
		metadata	Metadata of the spatial data set	MD_Metadata	1	voidable
Identifier	External unique object identifier published by the responsible body, which may be used by external applications to reference	localId	A local identifier, assigned by the data provider. The	CharacterString	1	
		namespace	Namespace uniquely identifying the data source	CharacterString	1	
		versionId	The identifier of the particular version of the	CharacterString	0..1	voidable

Le mapping tables

Application Schema 'AdministrativeUnits' (version 0)															Source Location of information					
Feature Type / Data Type	Documentation	Attribute / Association role / Constraint	Attribute / Association role / Constraint documentation	Data Type / Values / Code List - Enumeration	Multiplicity	Voidable / Non-Voidable	Data Type Attribute	Data Type Attribute document	Data Type / Values / Code Lists / Enumerations	Multiplicity	Voidable / Non-Voidable	"File name" or URL	Name of attribute	Example of one data source value	Example of one data target value	Void Reason	Remarks			
AdministrativeUnit	-- Name -- administrative unit. Unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.	country	-- Name -- country	CountryCode* BE*	1	voidable														
		beginLifespanVersion	-- Name -- begin lifespan version	DateTime	1	voidable														
		endLifespanVersion	-- Name -- end lifespan version	DateTime	0..1	voidable														
		geometry	-- Name -- geometry	GM_MultiSurface	1	voidable														
		inspireId	-- Name -- inspireId External object identifier of the spatial object. NOTE: An external object identifier.	Identifier	1	voidable	localId	A local identifier.	CharacterString	1	voidable									
		namespace	-- Name -- namespace	CharacterString	1	voidable	namespace	A namespace identifier.	CharacterString	1	voidable									
		versionId	-- Name -- versionId	CharacterString	0..1	voidable	versionId	A version identifier.	CharacterString	0..1	voidable									
		name	-- Name -- name	GeographicalName	1..*	voidable		See Geographical name data type						See Geographical name data type						
		nationalCode	-- Name -- national code	CharacterString	1	voidable														
		nationalLevel	-- Name -- national level Level in the national administrative hierarchy, at which the administrative unit is located.	AdministrativeHierarchyLevel* 1stOrder* 2ndOrder* 3rdOrder* 4thOrder* 5thOrder* 6thOrder*	1	voidable														
		nationalLevelName	-- Name -- national level name	LocalisedCharacterString	1..*	voidable														
		residenceOfAuthority	-- Name -- residence of authority	ResidenceOfAuthority	1..*	voidable		See ResidenceOfAuthority data type												
		condominium	-- Name -- condominium	Condominium	0..*	voidable		See condominium feature type												
		boundary	-- Name -- boundary The administrative boundary.	AdministrativeBoundary	1..*	voidable		See Administrativeboundary feature type												
		lowerLevelUnit	-- Name -- lower level unit	AdministrativeUnit	0..*	voidable		See AdministrativeUnit feature type												
		upperLevelUnit	-- Name -- upper level unit	AdministrativeUnit	0..1	voidable		See AdministrativeUnit feature type												
		administeredBy	-- Name -- administered by	AdministrativeUnit	0..*	voidable		See AdministrativeUnit feature type												
		coAdminister	-- Name -- co-administer	AdministrativeUnit	0..*	voidable		See AdministrativeUnit feature type												
CondominiumsATC																				
AdministrativeUnit		No unit at highest level																		
AdministrativeUnitL		No unit at lowest level																		
AdministrativeBoundary	-- Name -- administrative boundary. A line of demarcation between administrative units.	beginLifespanVersion	-- Name -- begin lifespan version	DateTime	1	voidable														
		country	-- Name -- country	CountryCode* BE*	1	voidable														
		endLifespanVersion	-- Name -- end lifespan version	DateTime	0..1	voidable														
		geometry	-- Name -- geometry	GM_Curve	1	voidable														
		inspireId	-- Name -- inspireId External object identifier of the spatial object. NOTE: An external object identifier.	Identifier	1	voidable	localId	A local identifier.	CharacterString	1	voidable									
		namespace	-- Name -- namespace	CharacterString	1	voidable	namespace	A namespace identifier.	CharacterString	1	voidable									
		versionId	-- Name -- versionId	CharacterString	0..1	voidable	versionId	A version identifier.	CharacterString	0..1	voidable									
		legalStatus	-- Name -- legal status	LegalStatusValue*	1	voidable														
nationalLevel	-- Name -- national level	AdministrativeHierarchyLevel* 1stOrder* 2ndOrder* 3rdOrder* 4thOrder* 5thOrder* 6thOrder*	1..6	voidable																
technicalStatus	-- Name -- technical status	TechnicalStatusValue*	1	voidable																

Le mapping tables

Application Schema 'AdministrativeUnits' (version 3.0)																		Source Location of information					
Feature Type / Data Type	Documentation	Attribute Association role / Constraint	Attribute / Association role / Constraint documentation	Data Type / Values / Code List / Enumeration	Multiplicity	Voidable / Non-Voidable	Data Type Attribute	Data Type Attribute document	Data Type / Values / Code Lists / Enumerations	Multiplicity	Voidable / Non-Voidable	"The name" or URL	Name of attribute	Example of one data source value	Example of one data target value	Void Reason	Remarks						
AdministrativeUnit	-- Name -- administrative unit. Unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.	country	-- Name -- country	CountryCode* BE* ISO 3166-1	1	voidable									IT								
		beginLifespanVersion	-- Name -- begin lifespan version	DateTime	1	voidable									2013-11-20T14:12:20								
		endLifespanVersion	-- Name -- end lifespan version	DateTime	0..1	voidable																	
		geometry	-- Name -- geometry	GM_MultiSurface	1							com2011.shp	shape										
		inspireId	-- Name -- inspireId External object identifier of the spatial object. NOTE: An external object	Identifier	1		localId	A local identifier	CharacterString	1		com2011.shp	pro_com	78083	78083								
							namespace	Namespac	CharacterString	1					AUT.JSTAT								
							versionId	The identifier of the version	CharacterString	0..1	voidable												
		name	-- Name -- name	GeographicalName	1..*			See Geographical name data type						See Geographical name data type									
		nationalCode	-- Name -- national code	CharacterString	1							com2011.shp	pro_com	78083	78083								
		nationalLevel	-- Name -- national level Level in the national administrative hierarchy, at which the administrative unit is defined	AdministrativeHierarchyLevel* 1stOrder* 2ndOrder* 3rdOrder* 4thOrder* 5thOrder* 6thOrder*	1										http://inspire.ec.europa.eu/code/list/AdministrativeHierarchyLevel/4thOrder								
		nationalLevelName	-- Name -- national level name	LocalizedCharacterString	1..*	voidable									Comune								
		residenceOfAuthority	-- Name -- residence of authority	ResidenceOfAuthority	1..*	voidable		See ResidenceOfAuthority data type								Unknown							
		condominium	-- Name -- condominium	Condominium	0..*	voidable		See condominium feature type															
		boundary	-- Name -- boundary	AdministrativeBoundary	1..*	voidable		See AdministrativeBoundary feature type				com2011.Boundary.shp	nome_com + nome_com_ad	Morano Calabro + Rotonda	#Morano Calabro_Rotonda								
lowerLevelUnit	-- Name -- lower level unit	AdministrativeUnit	0..*	voidable		See AdministrativeUnit feature type																	
upperLevelUnit	-- Name -- upper level unit	AdministrativeUnit	0..1	voidable		See AdministrativeUnit feature type								#Provincia_78									
administeredBy	-- Name -- administered by	AdministrativeUnit	0..*	voidable		See AdministrativeUnit feature type																	
coAdminister	-- Name -- co-administer	AdministrativeUnit	0..*	voidable		See AdministrativeUnit feature type																	
CondominiumsATC	Association role																						
AdministrativeUnit	No unit at highest level																						
AdministrativeUnit	No unit at lowest level																						
AdministrativeBoundary	-- Name -- administrative boundary. A line of demarcation between administrative units.	beginLifespanVersion	-- Name -- begin lifespan version	DateTime	1	voidable									2013-11-20T14:12:20								
		country	-- Name -- country	CountryCode* BE* ISO 3166-1	1										IT								
		endLifespanVersion	-- Name -- end lifespan version	DateTime	0..1	voidable																	
		geometry	-- Name -- geometry	GM_Curve	1							com2011.Boundary.shp	shape										
		inspireId	-- Name -- inspireId External object identifier of the spatial object. NOTE: An external object	Identifier	1		localId	A local identifier	CharacterString	1		com2011.Boundary.shp	nome_com + nome_com_ad		Morano Calabro_Rotonda								
							namespace	Namespac	CharacterString	1					AUT.JSTAT								
							versionId	The identifier of the version	CharacterString	0..1	voidable												
		legalStatus	-- Name -- legal status	LegalStatusValue*	1	voidable									agreed								
		nationalLevel	-- Name -- national level	AdministrativeHierarchyLevel* 1stOrder* 2ndOrder* 3rdOrder* 4thOrder* 5thOrder* 6thOrder*	1..6										4thOrder								
		technicalStatus	-- Name -- technical status	TechnicalStatusValue*	1	voidable									edgeMatched								
admUnit	-- Name -- adm unit The administrative unit	AdministrativeUnit	1..*	voidable		See AdministrativeUnits feature type				com2011.Boundary.shp	nome_com + nome_com_ad		Morano Calabro_Rotonda										
Condominium	-- Name -- condominium An administrative area established	beginLifespanVersion	-- Name -- begin lifespan version	DateTime	1	voidable																	
		endLifespanVersion	-- Name -- end lifespan version	DateTime	0..1	voidable																	
		geometry	-- Name -- geometry	GM_MultiSurface	1																		

I sw di trasformazione

- sw open source: HUMBOLDT Alignment Editor (HALE).
- sw proprietari: GO Publisher (distribuito da Snowflake Software)

La validazione dei dati: dalle ATS alle ETS

- Abstract Test Suite (ATS) incluse nell'Annex A di tutte le Data Specifications –Technical Guidelines relative ai data themes degli Annex I/II/III
 - Part 1 (normative) IR Requirements
 - Part 2 (informative) TG Requirements

La validazione dei dati: dalle ATS alle ETS

Conformance Class	Tests
A.1 Application Schema Conformance Class	A.1.1 Schema element denomination test
	A.1.2 Value type test
	A.1.3 Value test
	A.1.4 Attributes/associations completeness test
	A.1.5 Abstract spatial object test
	A.1.6 Constraints test
	A.1.7 Geometry representation test
A.2 Reference Systems Conformance Class	A.2.1 Datum test
	A.2.2 Coordinate reference system test
	A.2.3 Grid test
	A.2.4 View service coordinate reference system test
	A.2.5 Temporal reference system test
	A.2.6 Units of measurements test
A.3 Data Consistency Conformance Class	A.3.1 Unique identifier persistency test
	A.3.2 Version consistency test
	A.3.3 Life cycle time sequence test
	A.3.4 Validity time sequence test
	A.3.5 Update frequency test
A.4 Data Quality Conformance Class	A.4.1 Data quality target results test
A.5 Metadata IR Conformance Class	A.5.1 Metadata for interoperability test
A.6 Information Accessibility Conformance Class	A.6.1 Code list publication test
	A.6.2 CRS publication test
	A.6.3 CRS identification test
	A.6.4 Grid identification test
A.7 Data Delivery Conformance Class	A.7.1 Encoding compliance test
A.8 Portrayal Conformance Class	A.8.1 Layer designation test

La validazione dei dati: dalle ATS alle ETS

Part 1 (normative)

Conformity with Commission Regulation No 1089/2010

A.1 Application Schema Conformance Class

Conformance class:

<http://inspire.ec.europa.eu/conformance-class/ir/ef/as/<application schema namespace prefix>>

A.1.1 Schema element denomination test

a) Purpose: Verification whether each element of the dataset under inspection carries a name specified in the target application schema(s).

b) Reference: Art. 3 and Art.4 of Commission Regulation No 1089/2010

c) Test Method: Examine whether the corresponding elements of the source schema (spatial object types, data types, attributes, association roles, code lists, and enumerations) are mapped to the target schema with the correct designation of mnemonic names.

NOTE Further technical information is in the Feature catalogue and UML diagram of the application schema(s) in section 5.2.

La validazione dei dati: dalle ATS alle ETS

- Già durante la fase di trasformazione dei dati con HALE viene effettuata una validazione rispetto allo schema
 - validazione «live» rispetto all'xsd effettuata durante la trasformazione
 - validazione rispetto all'xsd effettuata a valle della trasformazione sul dataset trasformato

La validazione dei dati: dalle ATS alle ETS

- Una suite di test eseguibili (ETS) che consenta di dichiarare la conformità a tutti i test dell'ATS:
 - eENVplus validation service (OGC CITE, INSPIRE MIG, EEA)

La validazione dei dati: dalle ATS alle ETS

The **eENVplus Validation Service** provides an implementation of the Abstract Test Suite (ATS) included in the **Annex A of the INSPIRE Data Specifications** which is a starting point of the conformance testing process. It includes a set of tests to be applied on a dataset to evaluate whether it fulfils the INSPIRE requirements.

Annex A - Part 1: includes tests aiming at assessing the conformity of GML datasets to "COMMISSION REGULATION (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial datasets and services" and its successive amendment "COMMISSION REGULATION (EU) No 1253/2013 of 21 October 2013".

Annex A - Part 2: includes tests aiming at assessing conformity of GML datasets to relevant INSPIRE Data Specifications - Technical Guidelines (TG) requirements.

The requirements to be tested are grouped in several **Conformance Classes**.
Each of these classes covers a specific aspect: for example A.1 conformance class contains tests reflecting the requirements on the application schema, A.2 conformance class contains tests reflecting the requirements on the reference systems, etc ...
In order to be **conformant** to a specific conformance class, a dataset has to **pass all tests defined for that conformance class**.
If a dataset is not yet conformant with all requirements of the data specification, **conformity to individual conformance classes can be claimed**.

Abstract tests associated to Conformance Classes must be put into practice: an **Executable Test Suite (ETS)**, containing a physical implementation of the abstract tests, must be derived from the Abstract Test Suite.
For those tests that cannot be automated the ETS contain guidelines to manual execution.
A single executable test can cover different abstract tests.

Tests included in the **Abstract Test Suite (ATS)** vary according to the different data themes.
Select the **INSPIRE Theme** from the underlying dropdown list to display the **ATS** included in the Annex A of the relevant **INSPIRE Data Specifications** and have access to the associated **Executable test Suite (ETS)**.

Select an INSPIRE Theme

- Coordinate reference systems
- Geographical grid systems
- Geographical names
- Administrative units
- Addresses
- Cadastral parcels
- Transport networks
- Hydrography
- Protected Sites
- Elevation

```

graph LR
    ATS[ATS] --> A1[A.1]
    ATS --> A2[A.2]
    ATS --> Am[A.m]
    A1 --> T11[Test 1.1]
    A1 --> T12[Test 1.2]
    A1 --> T1n[Test 1.n]
    A2 --> T21[Test 2.1]
    A2 --> T2n[Test 2.n]
    Am --> Tmn[Test m.n]
    T11 --> ET1[E-Test 1]
    T12 --> ET1
    T1n --> ET1
    T21 --> ET2[E-Test 2]
    T2n --> ET2
    Tmn --> ETn[E-Test n]
    ET1 --> ETS[ETS]
    ET2 --> ETS
    ETn --> ETS
  
```

The screenshot shows the LINKVIT website with the following content:

- Navigation Bar:** Includes links for Home, The project, Communication, Training Modules, Partners, and Partner Area. A language selector for Italiano is also present.
- Project Overview:**
 - The project:** Describes the project's basis on European initiatives and the INSPIRE Directive. Includes a "Read more »" button.
 - Training Modules:** (Highlighted with a red border) Describes the harmonized Training Package and the complementarity of different modules. Includes a "Read more »" button.
 - Communication:** States that all events and dissemination material are available here. Includes a "Read more »" button.
- LINKVIT: ... "New Skills for New Jobs"**
 - Purpose:** States that LINKVIT will make a significant contribution to the progress of the INSPIRE Directive, bringing a revolution in geo-information (GI) and a need of specific skill in public administration and GI.

Grazie!



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