Semantic model transformation within the context of INSPIRE

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Content

Motivation

EU

In May 2007 INSPIRE (Infrastructure for Spatial Information in the European Community) entered into force
Aims to ensure
compatibility
usability
in a community and cross-boundary context

BEV

Geodata infrastructure law GeoDIG establishing a Geodata infrastructure in Austria

Motivation

INSPIRE offers the users to
- **find**
- **browse**
- **share**
- **and download**

spatial data

Problem: every state or federal offices
- **create**
- **manage and**
- **provide**

in different systems, models and data formats

Solution: Harmonization of data models with the implementation of transformation services for geodata.

Data Model Basics

Model transformation of geodata

» Syntactical transformation

Syntax of geodata is converted -> insufficient for the purpose of use

» Semantic transformation

Data is restructured, supplemented and/or reduced to fit the target model

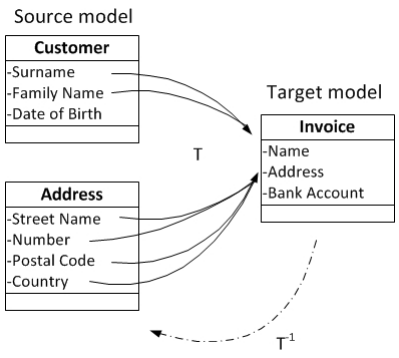
enables exchange of heterogeneous data

Data Model Basics

Semantic Transformation

Problems:

1. Lossless mapping of the semantics between different data models is not possible
2. The bijectivity of mapping rules from source- to target model is not guaranteed

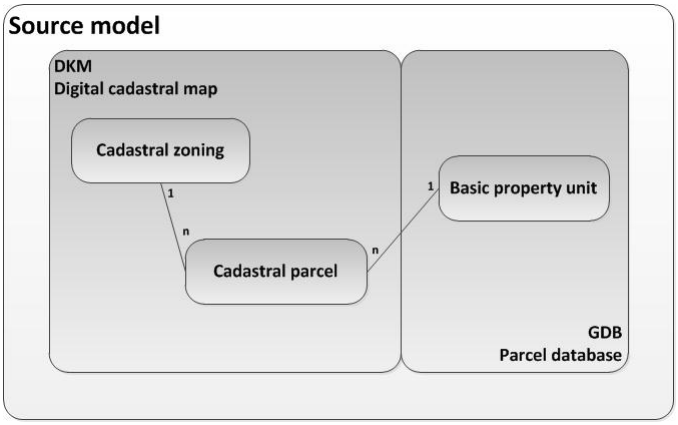


Source model for CP (Austria)

Based on 2 pillars

» cadastre (its technical implementation: digital cadastral map DKM)

» land register



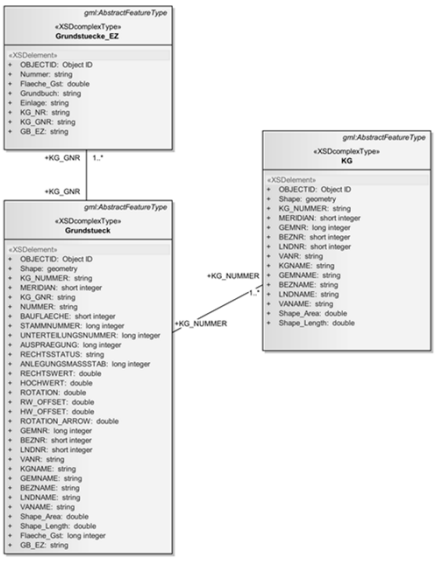
Source model for CP (Austria)

Source model consist of:

» Grundstueck = parcel

» Grundstueck_EZ = parcel_basic property unit

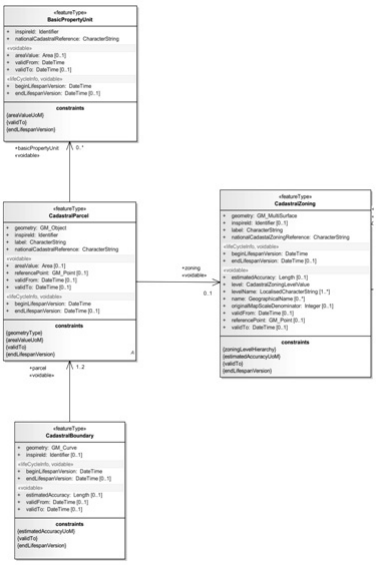
» KG = cadastral zoning



Target model for CP (INSPIRE)

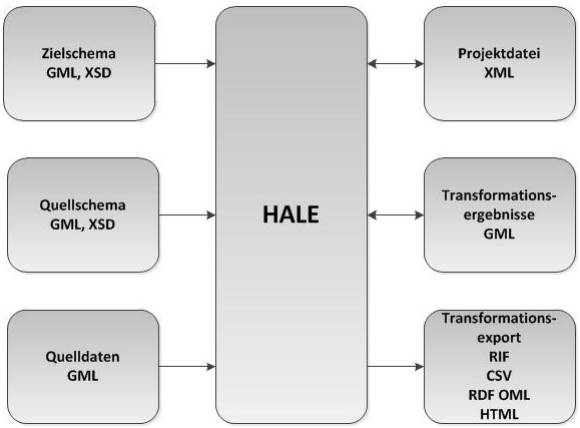
Target model consist of:

- BasicPropertyUnit
- CadastralBoundary
- CadastralParcel
- CadastralZoning



Humboldt Alignment Editor

- Open Source tool
- implemented within an EU Project



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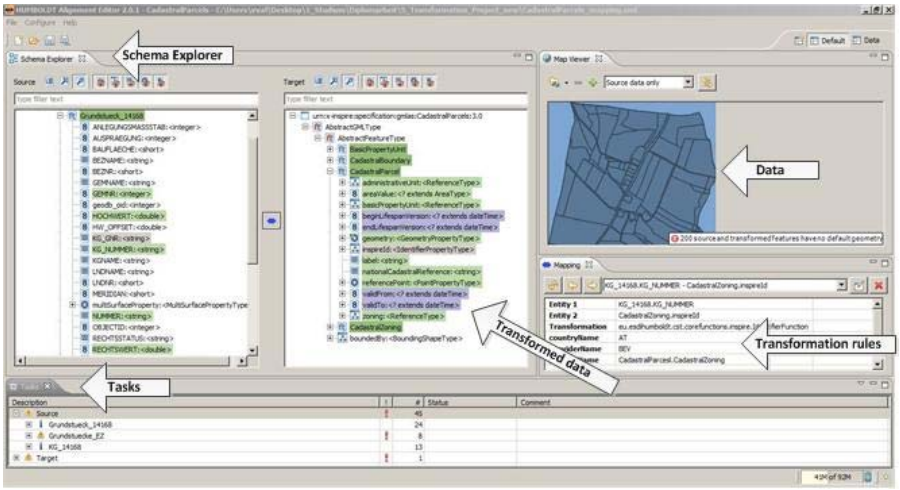

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Using an overview table

INSPIRE Elemente	DKM Element	M/V	Bestand	HALE Transformationsfunktion
CadastralParcel	**Grundstueck_14168_UTM33**			**Retype Feature**
administrativeUnit	GEMNR		✓	Attribute Rename Function auf Untertyp title
areaValue	Flaeche_GST	M	✓	Attribute Rename Function
basicPropertyUnit	GB_EZ	V	✓	Attribute Rename Function auf Untertyp title
beginLifespanVersion	✖	V	✖	NilReason Function
endLifespanVersion	✖	V	✖	NilReason Function
geometry	SurfaceProperty	M	✓	Attribute Rename Function
inspireID	KG_GNR	M	✓	INSPIRE Identifier Function

Limits of Implementation

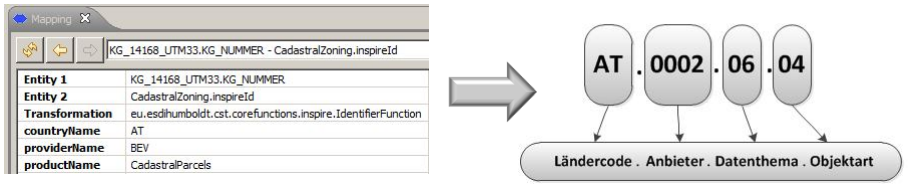
» **Not all voidable attributes could be filled**

INSPIRE Nil Reason

beginLifespanVersion, endLifespanVersion

validFrom, *validTo*

» **INSPIRE ID couldn‘t be generated**



Limits of Implementation

» **Estimated Accuracy maximum positional error**

Default value 20m within the Alps

» **Reference Point couldn‘t be generated**

CadastralParcels: Coordinates

CadastralZoning: CentroidFunction

Positives (links) und negatives (rechts) Ergebnis einer Centroid-Funktion

Conclusion

Most relevant results:

- Finding and investigating current transformation tools and their transformation language
- Analyzing the source model
- Analyzing the target model
- Establishing, executing and validating a prototype transformation

Conclusion

- In principle, semantic model transformation is **possible**
- Austrian data model **fulfills** the INSPIRE target model
- The tool shown is still **under-development**, essential functions are missing

  So keep an eye on development
- Data model in Austria will be **changed**
- Current implementation at BEV: Download and

  Transformation services

Thanks a lot for your attention!!!

Datathemes of INSPIRE WMS in BEV, in different scales