Semantic model transformation within the context of INSPIRE

unter der Anleitung von

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**Motivation**

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

**EU**

Geodata infrastructure law GeoDIG establishing a Geodata infrastructure in Austria.

**BEV**

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.
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

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 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
Using an overview table

<table>
<thead>
<tr>
<th>INSPIRE Element</th>
<th>DKM Element</th>
<th>M/V</th>
<th>Bestand</th>
<th>HALE Transformationsfunktion</th>
</tr>
</thead>
<tbody>
<tr>
<td>CadastralParcel</td>
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<td>✓</td>
<td>✓</td>
<td>Retype Feature</td>
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<td>GEMNR</td>
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<td>KG_GNR</td>
<td>✓</td>
<td>✓</td>
<td>INSPIRE identifier Function</td>
</tr>
</tbody>
</table>
**Limits of Implementation**

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

    INSPIRE Nil Reason

    `beginLifespanVersion, endLifespanVersion`

    `validFrom, validTo`

» **INSPIRE ID couldn’t be generated**

    ![INSPIRE ID](image)

**Estimated Accuracy maximum positional error**

    Default value 20m within the Alps

» **Reference Point couldn’t be generated**

    CadastralParcels: Coordinates

    CadastralZoning: CentroidFunction

![Example of a Centroid Function](image)
**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

**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