



Federal Agency for  
Cartography and Geodesy

# Implementing INSPIRE Download Services at BKG

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# Introduction

## About us

- Technical agency under the Federal Ministry of the Interior
- Central service provider and competence center for the German government for
  - Topographic data
  - Cartography
  - Geodetic reference systems
- Service Centre of the Federal Government for Geo-Information and Geodesy  
(Dienstleistungszentrum des Bundes für Geoinformation und Geodäsie - DLZ)
  - Central contact
  - Data provider
- Responsible for small scale data (starting at 1:200 000)
  - But also central distribution of federal large scale data (up to 1:100 000)

# Introduction

## BKG Products

Digital Topographic Maps

Digital Landscape Models

Geographical Names

Administrative Units

Digital Elevation Models

### OpenData

DTK250



DTK500-V



DTK1000



D2500

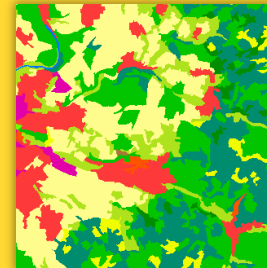


### Reported to INSPIRE

DLM250



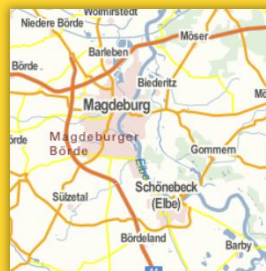
CLC10



VG250, VG1000, ...



DLM1000



GN250, GN-DE











DGM250, DGM500, ...



# Introduction

## Annex-Themes

Annex Theme	DLM*	CLC10	GN	VG*	DGM*
Annex I					
 Hydrography	yes				
 Transport Networks	yes				
 Administrative Units	yes**			yes	
 Geographical Names			yes		
 Protected Sites	yes				
 Geographical grid Systems					
Annex II					
 Elevation					yes
 Land cover		yes			

\* All scales \*\* Same as VG

# Introduction

Situation 01/2017

Milestones	DLM*	CLC10	GN	VG*	DGM*
Metadata available for spatial data sets	Yes**	Yes**	Yes	Yes**	Yes**
View Service	Yes	Yes	Yes	Yes	Yes
Download Service	Atom	Atom	Atom and WFS	Atom	Atom
Metadata available for spatial services	Yes	Yes	Yes	Yes	Yes
Interoperability			Yes		

\* All scales

\*\* Own data specification

# Roadmap

1. Transformation of DLM250 till 23.11.2017
  - Themes: TN, HY, AU, PS
  - Services on product base → one service for multiple INSPIRE themes
2. No transformation and services DLM1000
  - Product is derived from DLM250
3. No transformation and services for VG250/VG1000
  - Products are derived from DLM250/DLM1000
4. CLC10 in 2017
  - Theme: LC
  - Wait for experiences from DLM transformation and other institutions
5. DGM till 2020
  - Theme: EL
  - Observe WCS development

# Technical Solution

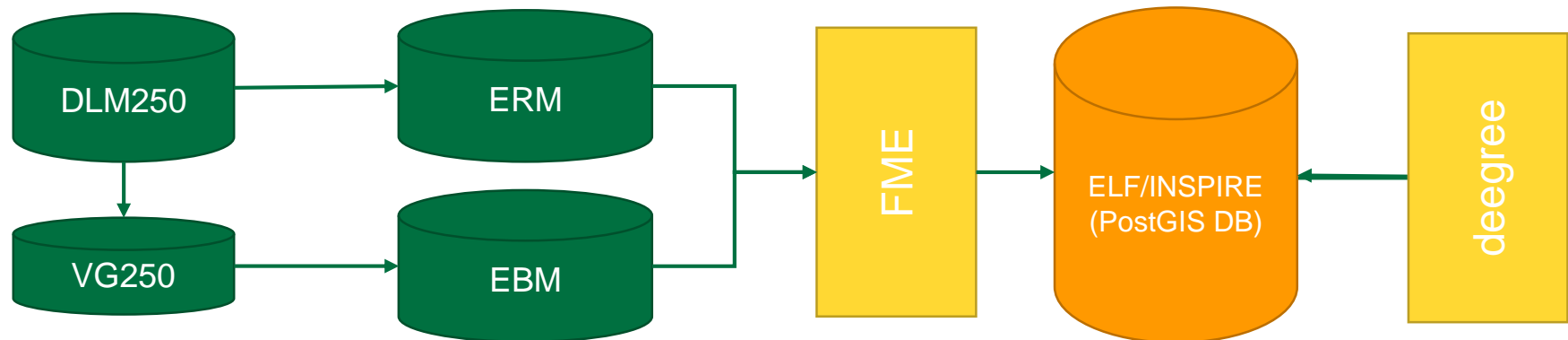
## Service

- INSPIRE Services based on deegree
- What is deegree?
  - Open source software for spatial data infrastructures and the geospatial web
  - Implements geospatial webservice specifications of the OGC and the INSPIRE Network Services
- Why deegree?
  - Implements WFS standards 1.0.0, 1.1.0 and 2.0.0
  - Designed for rich data models from the bottom up
  - Backend supports flexible mapping of GML application schemas to relational models
  - Implements WMS standards 1.1.1 and 1.3.0
  - Good experiences when participating in ELF-Project
  - Fits in our infrastructure

# Technical Solution

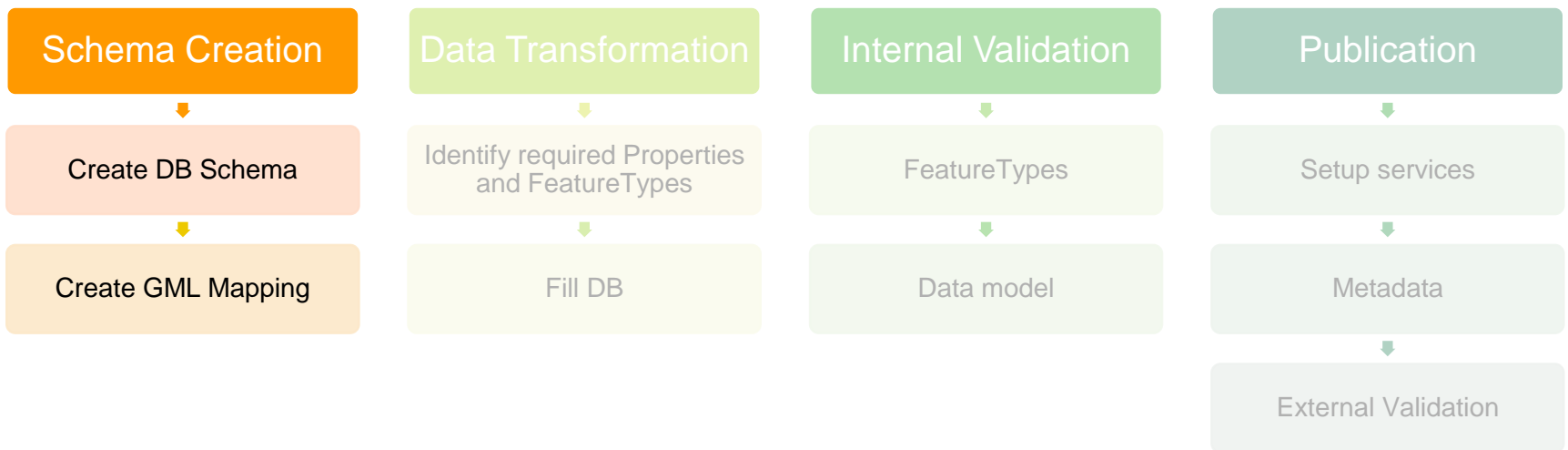
## Data Transformation

- Within ELF-Project transformation of Euro Geographics (EG) contents
- Existing processes for transformation of DLM250 to ERM/EGM
  - we can reuse the ELF-process
- GML proved as inflexible and had drawbacks





# The Process

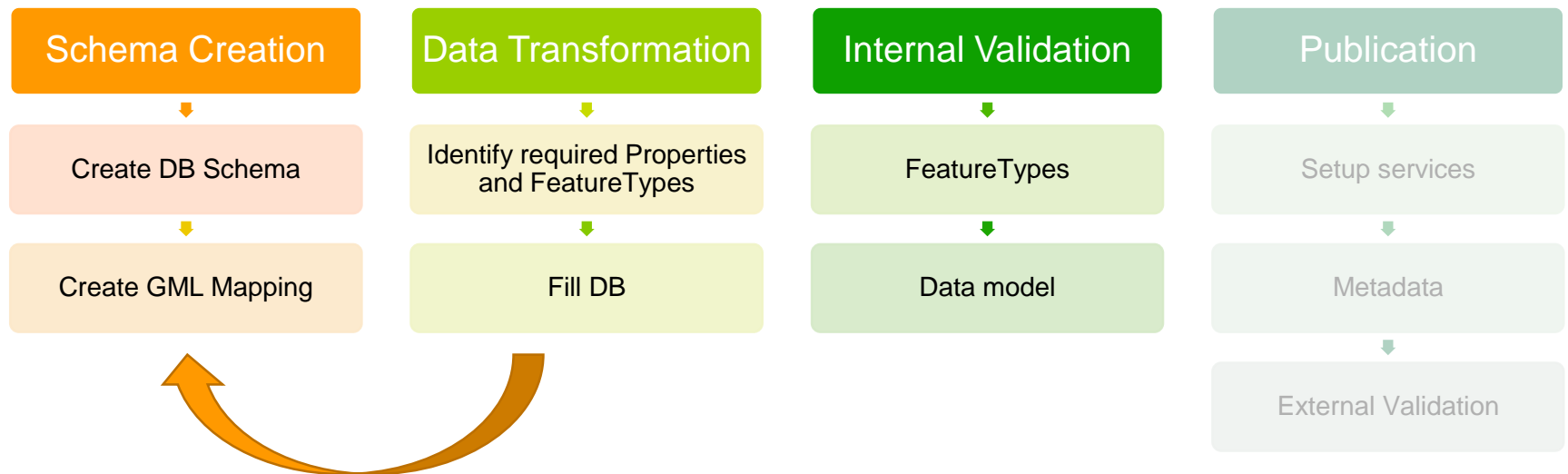


# The Process

## Schema Creation

- deegree offers tools to create mapping and DB schema from application schemas
  - Automated and GML-schema driven
  - Latest release drops wizard in GUI  
→ own tool based on deegree libraries
- Manual post processing
  - Putting themes in DB schemas for better structures
  - Renaming tables and column names
  - Dropping unused FeatureTypes, properties and relations
- Results for DLM250 published on GitHub
  - <https://github.com/de-bkg/deegree-workspace-dlm250-inspire>

# The Process

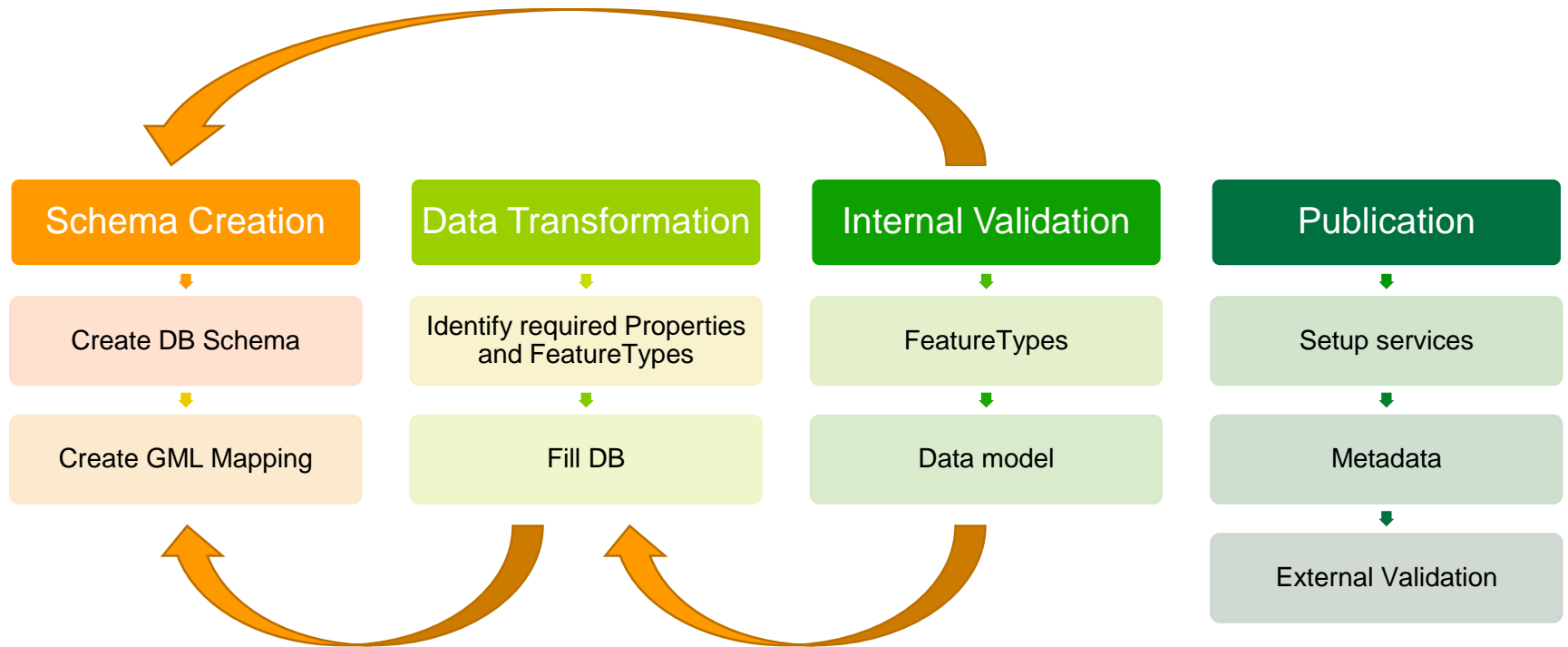


# The Process

## Validation

- We required a method to validate generated data and services
  - Does the service work?
  - Is the data modelling correct?
  - Feedback in early stage of development to reduce costs for fixing.
- Online validators not suited:
  - Mostly concentrating on service parameters and metadata
  - Can't use internal test services
- First approach: manually typing URLs
- We implemented simple tool for automatic testing
  - Validate provided FeatureTypes of WFS against schema
  - <https://github.com/de-bkg/wfs-ft-validator>

# The Process



# The Result

## What we achieved

- Data transformation for Annex I in DLM250 complete
- WFS DLM250 online  
[http://sg.geodatenzentrum.de/wfs\\_dlm250\\_inspire?SERVICE=WFS&REQUEST=GetCapabilities](http://sg.geodatenzentrum.de/wfs_dlm250_inspire?SERVICE=WFS&REQUEST=GetCapabilities)
  - Containing TN, HY, AU and PS
- Next steps and open issues
  - Finalize metadata records
  - External validation
  - Validate and optimize performance
  - Transformation and services for other products and Annex themes

# The Result

## How to use it?

- So we've done it! – What can we do with it?
- No ready to use clients for INSPIRE WFS available
- Most GIS have troubles handling complex FeatureTypes
- QGIS
  - WFS 2.0 Client
  - Complex GML Info
- Some Data models like TN are too complex for simple use cases
  - Very loose data structures where some attributes are only referenced via hrefs
  - Filtering for subsets of data sometimes not possible



# Summary

## Our Experiences

- Quite hard work to implement INSPIRE themes
- Learned a lot about INSPIRE data models
  - In some cases not practical
- Learned a lot about deegree
  - Powerful tool, but needs some IT skills
  - Community not very active
- We want to share:
  - Our Service:  
[http://sg.geodatenzentrum.de/wfs\\_dlm250\\_inspire?SERVICE=WFS&REQUEST=GetCapabilities](http://sg.geodatenzentrum.de/wfs_dlm250_inspire?SERVICE=WFS&REQUEST=GetCapabilities)
  - Deegree configuration:  
<https://github.com/de-bkg/deegree-workspace-dlm250-inspire>
  - Validation tool:  
<https://github.com/de-bkg/wfs-ft-validator>



# Thank you for your kind attention!

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## Ressources:

### Service:

[http://sg.geodatenzentrum.de/wfs\\_dlm250\\_inspire](http://sg.geodatenzentrum.de/wfs_dlm250_inspire)

### Deegree configuration:

<https://github.com/de-bkg/deegree-workspace-dlm250-inspire>

### Validation tool:

<https://github.com/de-bkg/wfs-ft-validator>