



Shaping PortalU[®]/InGrid[®] to meet the INSPIRE requirements

*First experiences and some considerations on how to efficiently organize
the German spatial data infrastructure as INSPIRE node*

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Koordinierungsstelle
PortalU



- introduction
PortalU®, InGrid®, Coordination Center PortalU, INSPIRE ...
- metadata model adjustments needed to emerge from ISO 19115/19119-compliant to “INSPIRE-proof” metadata
- the German geospatial data infrastructure (GDI-DE) with respect to INSPIRE, how to organize efficiently ?



PortalU / InGrid / InGridCatalog

- PortalU is Germany's **environmental information portal**: <http://www.portalu.de>
- 'one stop' for environmental data and metadata held **by the German federal government & states**
- search engine accesses web pages, databases ("hidden web"), **environmental data catalogs**
- currently > 200 information providers, ~ 2.5 million web pages indexed
- **InGrid**: „information grid“, **the software behind PortalU**
- **InGridCatalog** (IGC): the InGrid Metadata component, successor of the "Umweltdatenkatalog" (UDK)
- IGC is **ISO 19115/19119 compliant. Near future: INSPIRE conform**

Coordination Center PortalU

- funded by an administrative agreement between the German federal government and the federal states
- operation and further development of PortalU/InGrid
- support the metadata retrieval and maintenance within the german environmental authorities
- as LMO ("Legally Mandated Organisation") member of the INSPIRE drafting team metadata



INSPIRE

- INSPIRE: *Infrastructure for Spatial Information in Europe*
- May 15th, 2007: the INSPIRE Directive (2007/2/EG) entered into force
- INSPIRE ...
 - ... demands web-based online-services for discovery, visualisation and download of spatial data
 - ... will ease pan-european use of geodata
 - ... has to be adopted to national rights within two years (!)
- the technical details are covered in so called “implementing rules” which are currently under development (metadata, network services, data specifications, etc.)
- INSPIRE Metadata Implementing Rules, status:
 - May 14th, 2008: IRs metadata approved by the INSPIRE Committee, adoption procedure started
 - final publication expected soon
 - after publication the IRs are directly applicable law in the member states
 - 2010 (Annex I & II) / 2013 (Annex III) national metadata has to be provided for INSPIRE



INSPIRE: metadata and metadata exchange

- INSPIRE directive (16): *...implementing rules should be based, where possible, on international standards...*
- our main intentions to participate in the DT Metadata and the INSPIRE process in general:
 - (1) **keep INSPIRE as close as possible to ISO 19115/19119** in terms of metadata content: No excessive costs for existing, ISO-compliant catalogs like the IGC
 - (2) **tie OGC CSW metadata exchange specifications** (DT Network Services) **to INSPIRE**: Again, no excessive costs for german catalog systems which commit themselves to OGC CSW 2.0.2 AP ISO 1.0 through the GDI-DE architecture concept
- both have been *nearly* met:
 - (1) **IR Metadata (4.3.3)**: *...The standardisation activity in this area has reached level of maturity. A metadata standard dedicated to Geographic Information is available with the publication of ISO 19115... INSPIRE IR Metadata are very close to ISO 19115/19119*
 - (2) **Draft IR Discovery and View Services (7.4.1)**: *...In order to provide search support for all search metadata elements as defined by the INSPIRE Metadata IRs, the OGC CSW ISO 19115/19119 Application Profile (CSW ISO AP) shall be used as the reference specification for the INSPIRE Discovery Service...*



From ISO-compliant to INSPIRE-proof metadata – discrepancies between ISO 19115/19119 and INSPIRE metadata

- IR Metadata, 2.2.7: *conformity*
- IR Metadata, 2.2.1.5: *unique resource identifier*
- IR Metadata, 2.2.8: *constraint related to access and use*
- IR Metadata, 2.2.6.1: *lineage*
- IR Metadata, 2.2.2.2: *spatial data service type*
- IR Metadata, 2.2.3: *keyword, Annex B.4 – ‚Service type‘*
- IR Metadata, 2.2.6.2: *spatial resolution*
- IR Metadata, 2.8: *metadata point of contact – ‚E-Mail-Address‘*
- IR Metadata, 2.9: *keyword*



IR Metadata: *2.2.7 conformity*

- new, INSPIRE-related three-column 1:n mandatory field group
 - (1) specification: INSPIRE Implementing Rules the dataset applies to
 - (2) specifications reference date (e.g. generation, modification, publication)
 - (3) degree of conformity: conformant / not conformant / not evaluated (Codelist B.5 *Degree of conformity*)

- refers to the requirement of the Directive in Articles 5-2 (a) and 11-2 (d) that metadata shall include information on the degree of conformity with the Implementing Rules provided in Art. 7-1, which refer to the interoperability and where practicable harmonization of spatial data sets and services.



2.2.1.5 unique resource identifier

- a value uniquely identifying the resource (!)
- uncertain how this will be realised, clarification by DT Data Specifications ?
- IGC first step solution (automatic): `<cat-id>:<UUID of the metadada-object>`
- example (SAPOS® - Reference Station 0655 Rotenburg):

`idc-ni:015C0BE7-76F6-11D3-AE10-00104B57C66D`

2.2.10.1 metadata point of contact – contact e-mail

- e-mail address becomes mandatory (ISO 19115 CI_Address + electronicMailAddress [0..*])



2.2.8 constraint related to access and use

- two-column 1:n field group with columns
 - (1) conditions applying to access and use of spatial datasets, services and fees (where applicable) – value domain: free text
 - (2) limitations on public access (fixed codelist specified in INSPIRE directive Article 13)
- regarding (1) *no conditions apply* and *conditions unknown* are possible
- regarding (2) *no limitations* is a possible option

2.2.6.1 lineage

- process history and/or overall quality of the spatial dataset
- becomes mandatory for geodata (ISO 19115 LI_Lineage + statement [0..1])



2.2.2.2 *spatial data service type*

- becomes mandatory for spatial data services
- value domain: fixed codelist
 - (1) Discovery Service (CSW)
 - (2) View Service (WMS)
 - (3) Download Service (e.g. WFS)
 - (4) Transformation Service (WCTS)
 - (5) Invoke Spatial Data Service
 - (6) Other Service

2.2.3 *keyword, annex B.4* – ‚classification of spatial data services‘

- becomes mandatory for spatial data services
- value domain: huge codelist (~70 entries) based on the geographic services taxonomy of EN ISO 19119, will be further developed with input from stakeholder communities



2.9 keyword

- at least one GEMET- (GEneral Multilingual Environmental Thesaurus) keyword relating to the INSPIRE Annex Themes becomes mandatory (<http://www.eionet.europa.eu/gemet/about>)
- GEMET has been developed by the European Topic Centre on Catalogue of Data Sources (ETC/CDS) and the European Environment Agency (EEA) since 1996
- consortium has been led by the Ministry of the Environment of Lower Saxony, members from Germany, Austria, Italy and Sweden
- EEA currently develops a list of GEMET keywords for the INSPIRE Annex Themes
- PortalU/IGC uses the UMTHEs-thesaurus of the German Federal Environment Agency (Umweltbundesamt) for keyword generation
- for every IGC/UDK metadata object, three UMTHEs keywords are mandatory
- GEMET is a subset of UMTHEs
- IGC INSPIRE catalog migration: Automatic GEMET/INSPIRE keyword generation based on the existing UMTHEs keywords will be possible by means of the Semantic Network Webservice SNS (<http://www.semantic-network.de>)



GDI-DE pilot project *Geodatenkatalog-DE*

- setup of a topology of existing german catalog services in line with INSPIRE
- grouping of the services to supply a central german metadata node for INSPIRE
- project service provider
 - several multidisciplinary geodata catalogs from german federal states
 - geodata catalog of the federal government (geoMIS.Bund)
 - the cross-state catalogs PortalU® (environment) and AdV-MIS (surveying)
- project user
 - Joint Research Center, European Commission, Ispra (<http://ec.europa.eu/dgs/jrc/>)
 - GIW-Commission (Federal Ministry of Economics and Technology, <http://www.geobusiness.org/>)



GDI-DE & INSPIRE requirements

- GDI-DE specification for catalog services: OpenGIS® Catalogue Services Specification 2.0.2 - ISO Metadata Application Profile (1.0.0)
- probably as well INSPIRE metadata exchange standard (state of discussion in DT Network Services):
 - ... *In order to provide search support for all search metadata elements as defined by the INSPIRE Metadata IRs, the OGC CSW ISO 19115/19119 Application Profile (CSW ISO AP) shall be used as the reference specification for the INSPIRE Discovery Service...* (Draft Implementing Rules for Discovery and View Services, 7.4.1)
- technical/functional requirements are formulated in the *Draft Implementing Rules for Discovery and View Services*, 7.4.3, e.g.:
 - time for sending initial response to service request in normal situation shall be **3 seconds**. This time shall allow to send **250 Metadata records**
 - the minimum number of **simultaneous service requests** served according to the performance requirement shall be **100** for the Discovery Service

-> hard to realize without caching and indexing mechanisms !



topology of (INSPIRE) catalog services

- INSPIRE (softly) demands a central metadata node for each member state -> geoPortal.Bund
- basic topology concepts
 - topically-based composition (PortalU, AdV MIS)
 - administrative hierarchy (local authority -> ... -> federal state -> ... -> federal government)
 - no cascading topology, direct connection of every single catalog to the national node, possibly supported by a registry service
- Status Quo: All three concepts already co-exist and have to be considered
- Geodatenkatalog-DE, first findings:
 - caching/harvesting/indexing mechanisms are necessary, at least for the central german INSPIRE metadata node, in order to meet INSPIRE demands
 - functionality is currently under development within the pilot project
- similar functionality is needed for information broker systems like PortalU/InGrid



summary & conclusion

- INSPIRE implementing rules currently taking more and more shape
- the relevant existing german geo- and environmental data catalogs are based on ISO 19115/19119, they seem to be sustainably and INSPIRE-ready
- technically, most german catalog owners and software suppliers committed themselves to provide/support OGC CSW AP ISO 1.0 interfaces
- when it comes to the practical implementation of the IRs, particularly with respect to service topologies and performance demands, a lot of questions are not answered yet
- this underlines that practical pilot projects and early prototyping is necessary to develop feasible strategies for national and european metadata flows
- PortalU/InGrid metadata components will be INSPIRE-proof end of 2008



Thank you for your attention !

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