Building the Infrastructure for Spatial Information in Europe (INSPIRE)

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Agenda

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- Introduction to INSPIRE
- Technical aspects of INSPIRE
- Benefits for users and providers
- Conclusion

Introduction to INSPIRE

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What is INSPIRE?

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- Acronym for Infrastructure for Spatial Information in Europe
- Directive of European Union for the introduction of an European Spatial Data Infrastructure (ESDI)
- The INSPIRE Directive entered into force on the 15th May 2007
- This directive is binding law in all the European Member States, driving massivly the creation of the ESDI.

The legal perspective of INSPIRE

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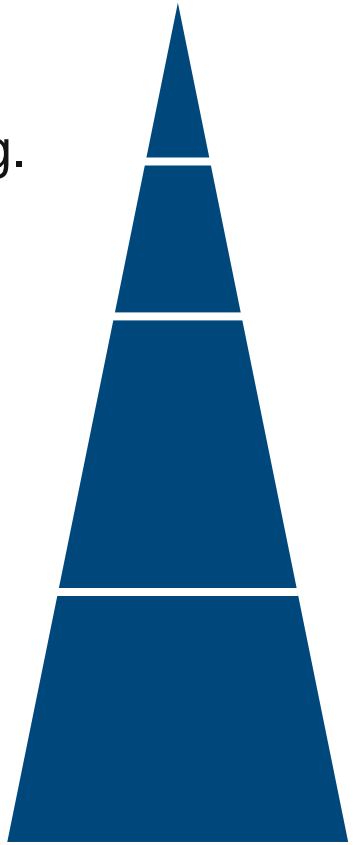
- Overall, the Directive is relevant for all member states of the European Union
- The Directive has to be transformed into national law (e.g. in Germany: Geodatenzugangsgesetz = Act for Spatial Data Access)
- (But:) not only federal but also regional and local level is adressed
- → current law on these levels must be adapted
- → process of several years
- INSPIRE is a FRAMEWORK Directive:
  Detailed technical provisions will be laid down in Implementing Rules (IR)
- IR are binding directly without local transformation



Why INSPIRE?

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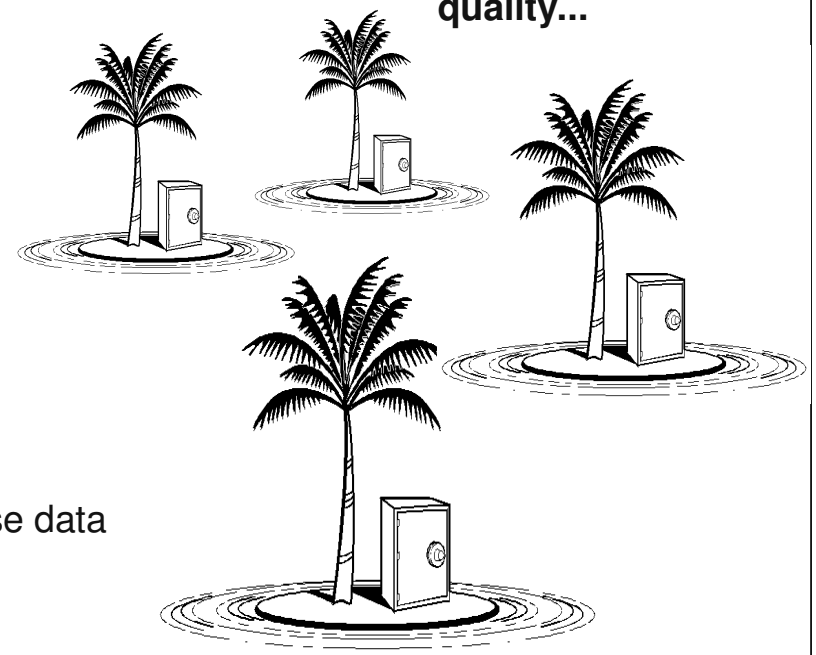
- Geo-spatial and Environmental information in Europe:
  State of the Art Analysis by Paul Smits, European Commission Joint Research Centre, Institute for Environment and Sustainability, 05/10/05

- Lack of data
  - fragmentation of datasets and sources
  - gaps in availability
  - lack of harmonisation between datasets at different geographical scales and duplication of information collection.
- Lack of co-ordination
  - across boarders
  - between levels of government
- Lack of standards and their use
  - incompatible information
  - incompatible information systems
  - fragmentation of information
  - redundancy
- Data policy restrictions
  - pricing, copyright, access rights, licensing policy

- These problems make it difficult to identify, access and use data that is available
- In summary: No infrastructure!

EU has islands of data of different standards and quality...



INSPIRE vision

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1. Data should be collected once and maintained at the level where this can be done most effectively
2. it should be possible to combine seamlessly spatial information from different sources across Europe and share it between many users and application
3. it should be possible for information collected at one level to be shared between all the different levels, detailed for detailed investigations, general for strategic purposes
4. geographic information needed for good governance at all levels should be abundant under conditions that do not refrain its extensive use
5. it should be easy to discover which geographic information is available, fits the needs for a particular use and under which conditions it can be acquired and used
6. geographic data should become easy to understand and interpret because it is properly documented and can be visualised within the appropriate context selected in a user-friendly way

The general idea

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Official INSPIRE Website of the EU says

- Initiative intends to trigger the creation of a European spatial information infrastructure that delivers to the users integrated spatial information services.
- These services should allow the users to identify and access spatial or geographical information from
  - a wide range of sources,
  - from the local level to the global level,
  - in an inter-operable way
  - for a variety of uses.
- The target users of INSPIRE include
  - policy-makers, planners and managers at
  - European, national and local level
  - and the citizens and their organisations.
- Possible services are the visualisation of information layers, overlay of information from different sources, spatial and temporal analysis, etc.
- *Source: http://www.ec-gis.org/inspire/whyinspire.cfm*

INSPIRE Components

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1. Metadata
2. Interoperability of spatial data sets and services
3. Network services (Discovery, view, download, invoke)
4. Data and Service sharing (policy)
5. Coordination and measures for Monitoring & Reporting

Spatial data themes addressed through INSPIRE

- The three annexes of the directive

Annex I	Annex II	Annex III
Coordinate reference systems	Elevation	Statistical units
Geographical grid systems	Land cover	Buildings
Geographical names	Orthoimagery	Soil
Administrative units	Geology	Land use
Addresses		Human health and safety
Cadastral parcels		Utility and governmental services
Transport networks		Environmental monitoring facilities
Hydrography		Production and industrial facilities
Protected sites		Agricultural and aquaculture facilities
		mography
		estriction / ng units
		Natural risk zones
		Atmospheric conditions
		Meteorological geographical features
		Oceanographic geographical features

mainly spatial reference data + environmental data

Timeframe/Phases

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Preparatory Phase (2004 – 2006)

- Co-decision procedure
- Start of preparation of Implementing Rules

Transposition Phase (2007 – 2009)

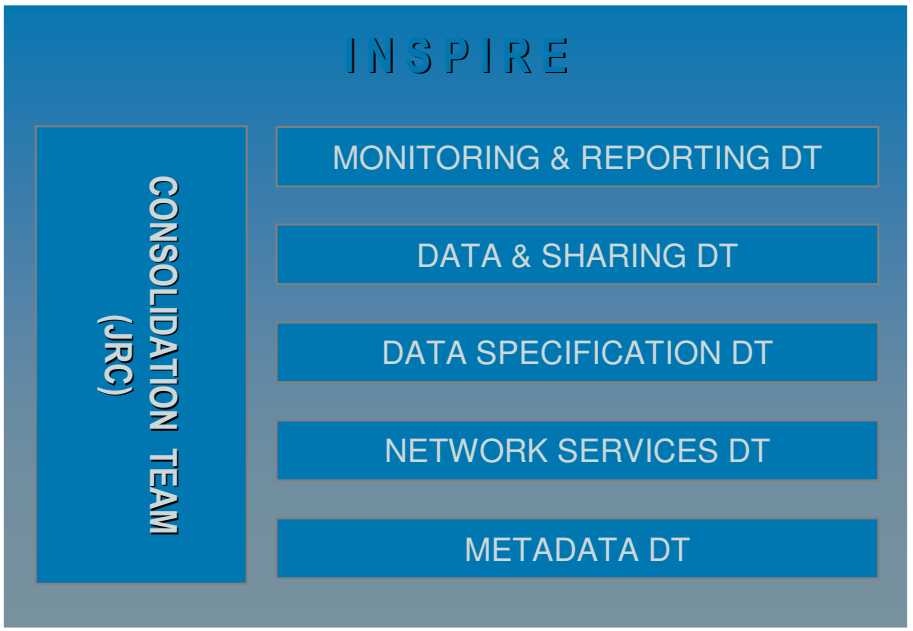
- Directive entered into force 15 May 2007
- INSPIRE Committee starts is activities 26 June 2007
- Continuation of preparation of Implementing Rules
- Transposition into national legislation
- Adoption of Implementing Rules

Implementation Phase (2009 – 2019)

- Continuation of Adoption of IR
- Implementation of IR
  - Prio I: Metadata
  - Prio II: Providing data

Implementing Rules

- Work is done by 5 INSPIRE Drafting Teams (DT)
- DTs consist of
  - Experts
- Review by
  - Spatial Data Interest Communities (SDIC)
  - Legal Mandated Organizations (LMO)
  - Finally public
- Approved by the INSPIRE Committee



Technical aspects of INSPIRE

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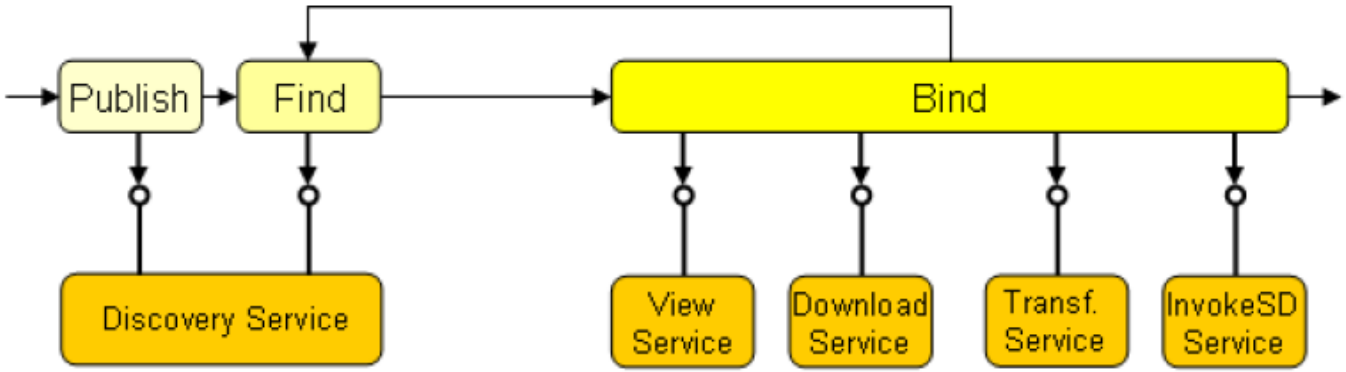
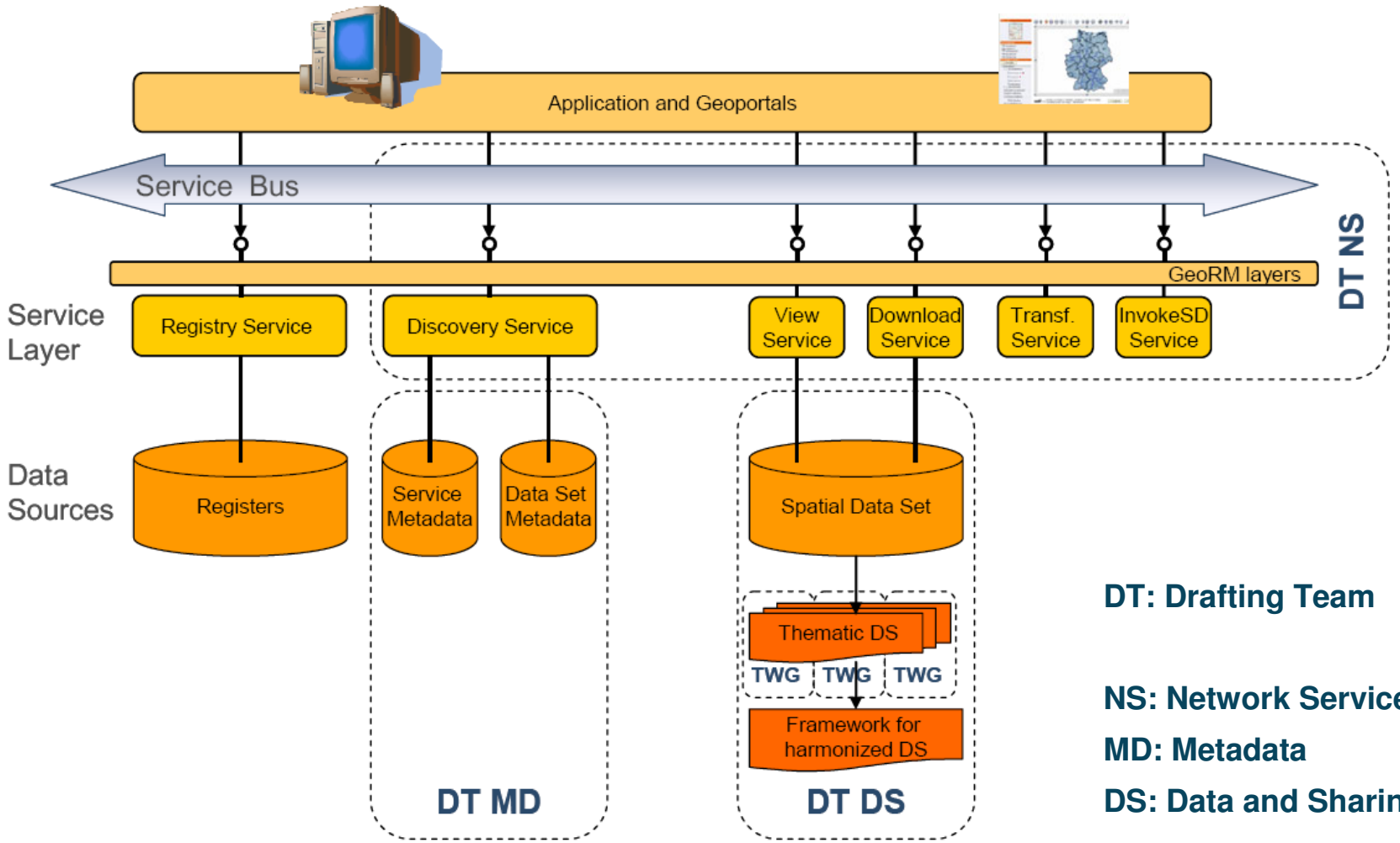
INSPIRE Paradigm

- Follows the idea of OGC Web services
- Publish-Find-Bind pattern



Source: http://www.ec-gis.org/inspire/reports/ImplementingRules/network/INSPIRETechnicalArchitectureOverview_v1.2.pdf

INSPIRE technical architecture overview



Source: http://www.ec-gis.org/inspire/reports/ImplementingRules/network/INSPIRETechnicalArchitectureOverview_v1.2.pdf

Some Intermediate Results

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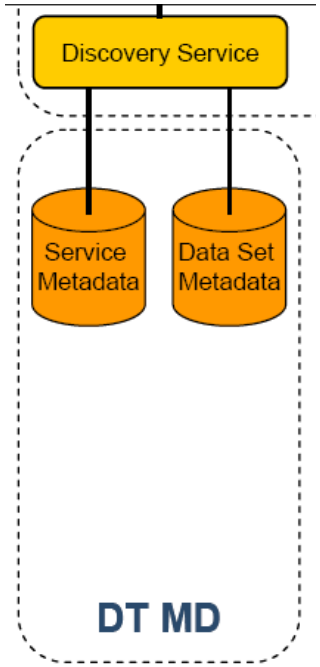
Drafting Team Metadata

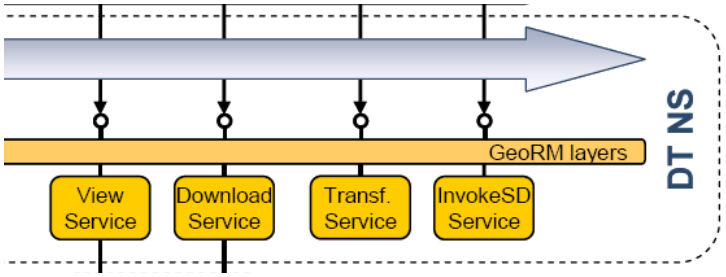
- INSPIRE Metadata Profile based on
  - ISO 19115 (data)
  - ISO 19119 (services)
- Some slight changes (mandatory elements, additional elements)
- Some add ons: e.g. use of GEMET thesaurus for environmental data
- Discovery Service
  - OGC Catalogue Service for the Web Version 2.0.2
  - With Application Profile ISO 1.0
  - Query language: OGC Filter Encoding



- Status/timeline
  - INSPIRE Implementing Rules on Metadata have been approved by the INSPIRE Committee on May 14, 2008
  - Will enter into force probably by Mid of June 2008
  - 2 Years for Implementation on data owners side (2010)!

Some Intermediate Results

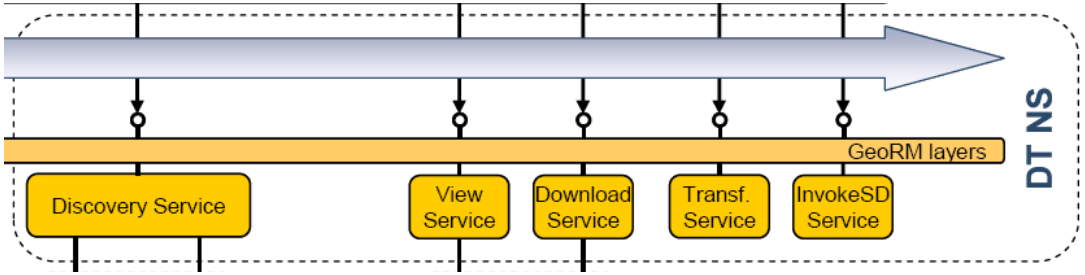
Drafting Team Network Services



- Current trends
  - The drafting team is not expected to develop new specifications
  - Implementing rules should be based on standards (when exist)
  - In general OGC services functionality shall be used
  - INSPIRE services shall be Web Services (W3C) – WSDL, SOAP, UDDI
- Cares beside others for the following services
  - **View services**: to display spatial data sets, legend information and metadata
    Current proposal: OGC WMS (Web Map Service); final proposal by 2008-11-15
  - **Download services**: to download copies of spatial data sets, or parts of such sets
    Current proposal:
    - OGC WFS (Web Feature Service)
    - OGC WCS (Web Coverage Service)
    - final proposal by 2009-05-15

Some Intermediate Results

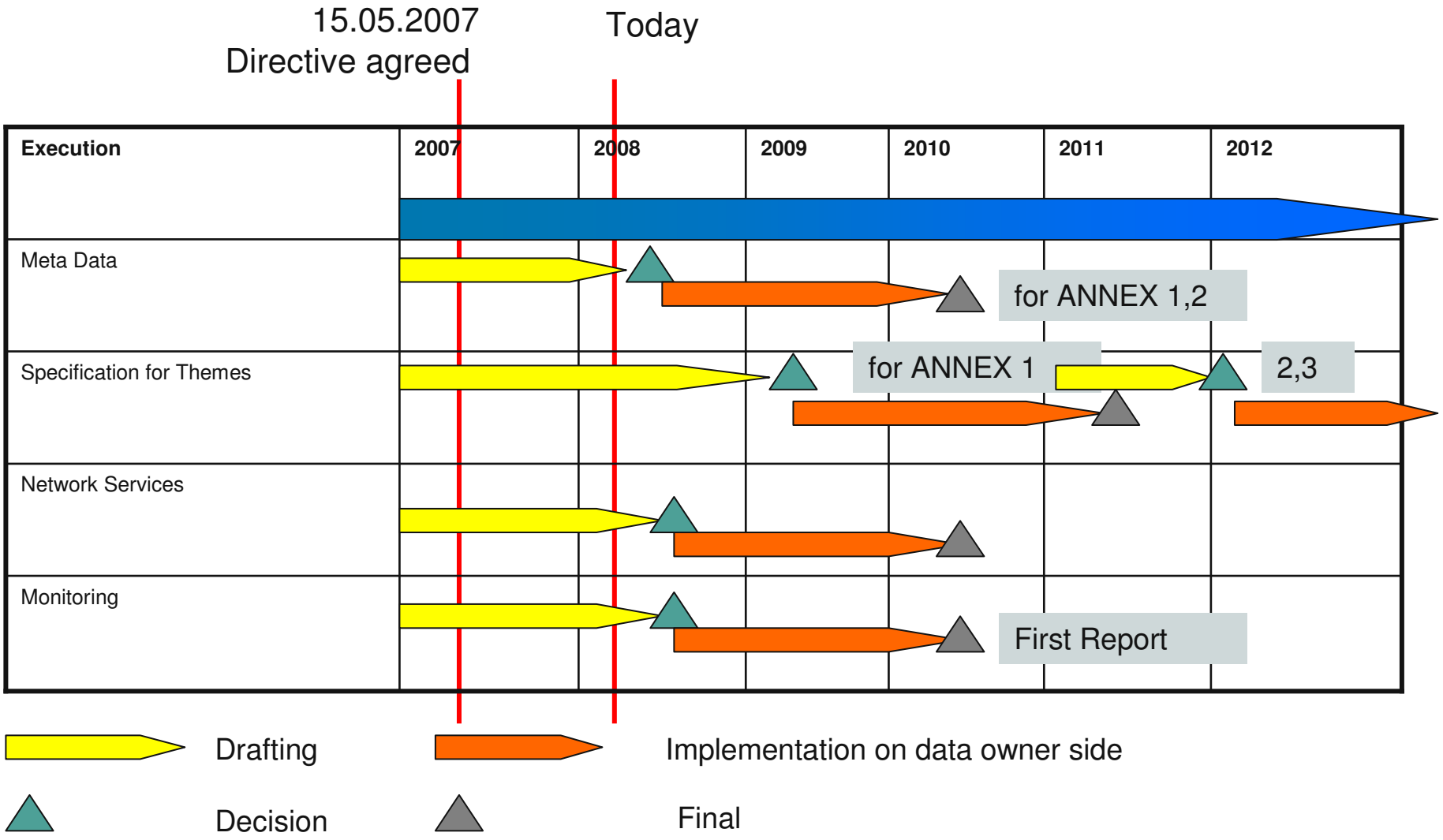
- Drafting Team Network Services (cont'd)



  - **Transformation services:** to transform spatial data sets for achieving interoperability
    2 Services discussed
    - Coordinate transformation service
      Current proposal: OGC WCTS (Web Coordinate Transformation Service)
      final proposal by 2009-05-15
    - Schema transformation service
      Current proposal: tbd as no OGC or ISO activity on this topic
      final proposal by 2010-11-15

  - **"Invoke services":** to invoke spatial data services (chaining services)
    - Trend: Service orchestration should be described using BPEL
    - final proposal by 2010-11-15

INSPIRE – the timeline



Major futures challenges

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- Common data policy (pricing, copyright, access rights, licensing)
- Digital Rights Management
- Data specification (all 30+ themes of Annex I – III have to be agreed on)
- Data harmonization
  - schema remodelling
  - Multilinguasm issues (23 official languages within the EU)
- technical infrastructure (performance!)
- Last but not least: bringing it all together!

Benefits for users and providers

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Benefits to users and providers

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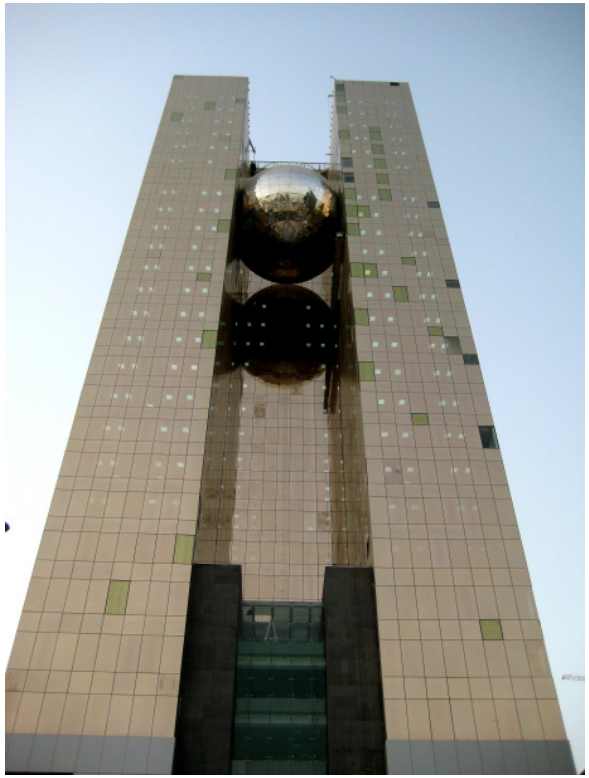
- INSPIRE implementing rules will solve the ongoing challenges of data exchange not only within the EU, but in a general way
- Market transparency!
  - Geospatial Market in Europe will become much more transparent due to better documentation of ressources (metadata) and standardized interfaces
- Geospatial communication blueprint!
  - INSPIRE will be the „protocol“ for geospatial communication in the future at least in Europe
- Full-grown interoperability!
  - INSPIRE will bring the European Geospatial Market to the next level of interoperability
- Business opportunities!
  - This will have positive impact also in the G2B and G2C game



Conclusion

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Conclusion

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- INSPIRE
  - is a Law
  - delivers transparency and optimization
  - is a true challenge due to 27 nations and the tough timeline
  - results in a massive revolution of the governmental GIS market
  - is a challenge for technology providers

- As a Government Agency in Europe start now to take care for
  - metadata
  - standardized web services for your INSPIRE ANNEX data

- Good preparation is key for all players!

Thank you for your attention!

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