

Publishing and using content in SDIs - how far are we?

Clemens Portele - interactive instruments GmbH

Cambridge Conference 2007 - Clemens Portele - July 2007

From silos to webs – how do we make interoperability a reality?

From silos ...



Traffic Messages,
Roads



Buildings,
Parcels,
Roads



Administrative
Areas



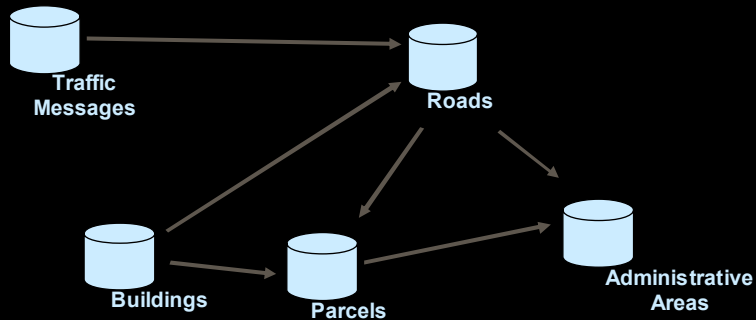
Roads,
Parcels,
Administrative
areas



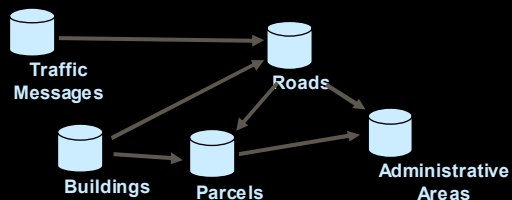
Parcels,
Administrative
areas

From silos to webs – how do we make interoperability a reality?

... to webs:

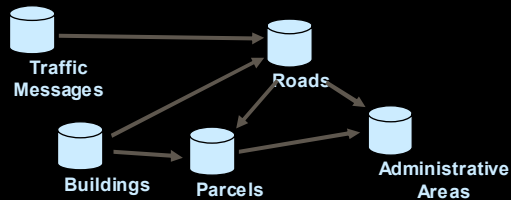


From silos to webs – how do we make interoperability a reality?



- Linking data
 - avoids redundancy
 - fosters consistency
- but requires
 - linking to other data specifications and adopting them
 - publication and transparent maintenance of models
 - a common framework
 - willingness to share and cooperate

From silos to webs – how do we make interoperability a reality?



- Linking data
 - avoids redundancy
 - fosters consistency
 - but requires
 - linking to other data specifically
 - publication and trust
 - a common language of models
- but how is this related to interoperability?**
- to share and cooperate

Interoperability

ISO 2382-1:

- Capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units

Interoperability

INSPIRE Directive:

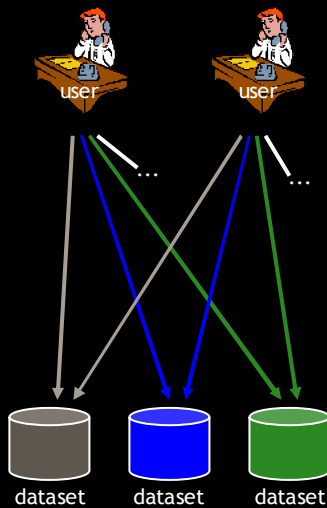
- Possibility for spatial data sets to be combined, and for services to interact, without repetitive manual intervention, in such a way that the result is coherent and the added value of the data sets and services is enhanced

Interoperability

OGC Glossary:

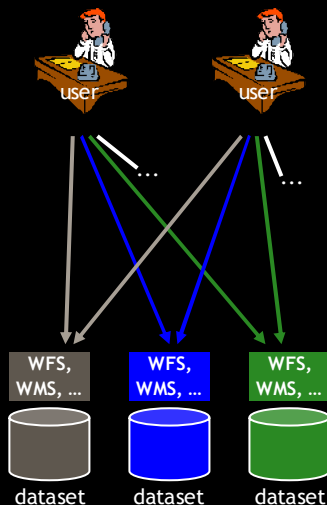
- The ability for a system or components of a system to provide information portability and interapplication, cooperative process control. Interoperability, in the context of the OpenGIS Specification, is software components operating reciprocally (working with each other) to overcome tedious batch conversion tasks, import/export obstacles, and distributed resource access barriers imposed by heterogeneous processing environments and heterogeneous data.

The point of departure ...



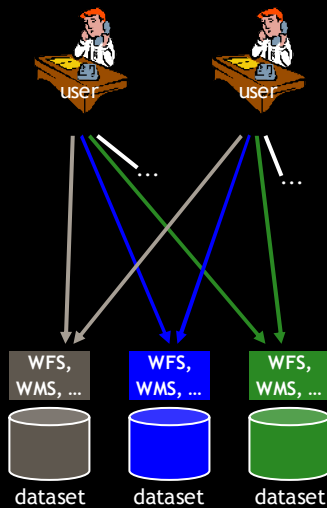
- Access to spatial data typically via digital media or by downloading complete datasets
- User has to deal with interpreting heterogeneous data in different formats and extract the information he needs

What is more and more common practice ...



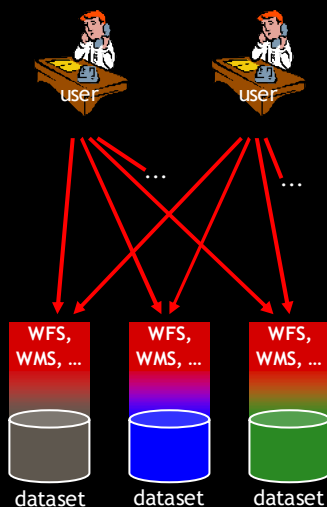
- SDIs allow publication and online access to spatial data via standardised web services
- The services (at least their current implementations) typically do not really support linking data remotely
- User still has to support / understand a variety of data specifications (if they are available at all)

What is more and more common practice ...



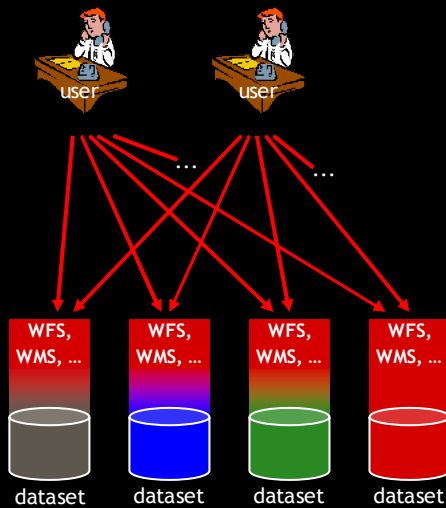
- Web Map Service (WMS)
 - WMS-aware clients can in general combine maps (or rather georeferenced pictures) from several sources
 - Web Feature Service (WFS)
 - Requires support for ISO 19100 / GML and the specific profile as well as an understanding of the data specification
 - Similar for Web Coverage Service (WCS) and other services
- Simplifies access to information, but does not solve the semantic issue (syntactic vs semantic interoperability)

As a result, communities are often aiming at agreed data specifications...



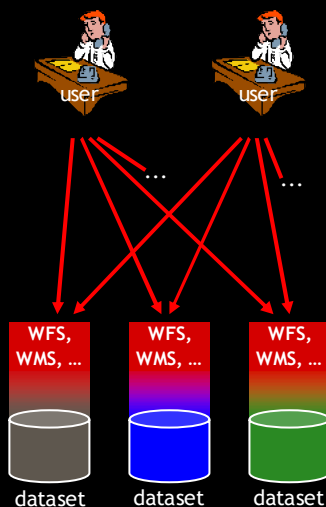
- Efforts ongoing in SDI activities to harmonise data content offerings (typically by data specifications based on the ISO 19100 series and OGC specifications)
- Each content provider has to translate between the internal data model and the harmonised data specification

As a result, communities are often aiming at agreed data specifications...



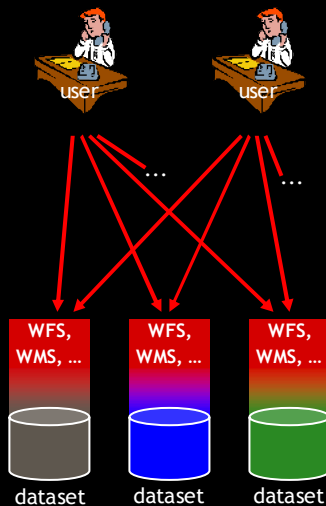
- Content providers may also choose to align their internal data model with the harmonised data specification

As a result, communities are often aiming at agreed data specifications...



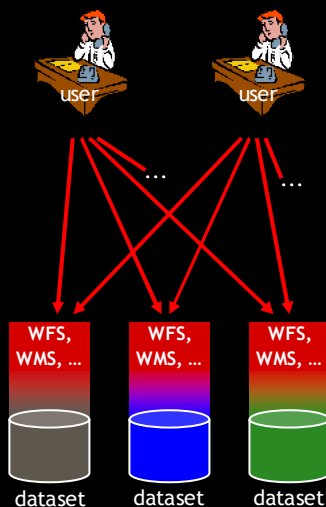
- Data specifications need to specify agreements on many aspects, including:
 - Terminology / Definitions
 - Application schemas
 - Spatial and temporal aspects
 - Codelists and classification schemes
 - Multi-lingual support
 - Cultural adaptability
 - Coordinate reference systems
 - Units of measurement
 - Portrayal rules
 - ...

As a result, communities are often aiming at agreed data specifications...



- Data specifications need to specify agreements on many aspects, including:
 - ...
 - Identifiers
 - Encoding
 - Resolving object references
 - Consistency between data
 - Level of detail / scale
 - Data capturing rules
 - Metadata including quality information
 - Associating data with services
 - ...

As a result, communities are often aiming at agreed data specifications...



- Without these agreements, using published data is usually still difficult as clients can rarely interpret and make full use of the data
- Publishing these data specifications in a way that allows to discover them and to process them electronically is key
- The development of harmonised data specifications is a complex process

Which level of harmonisation is „just right“?



Too simple:

- identified requirements cannot be supported
- insufficient harmonisation
- few benefits

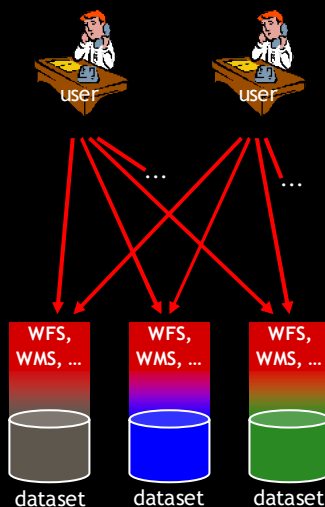
Too complex:

- difficult to implement
- substantial benefits available only to few users
- high cost

→ requires

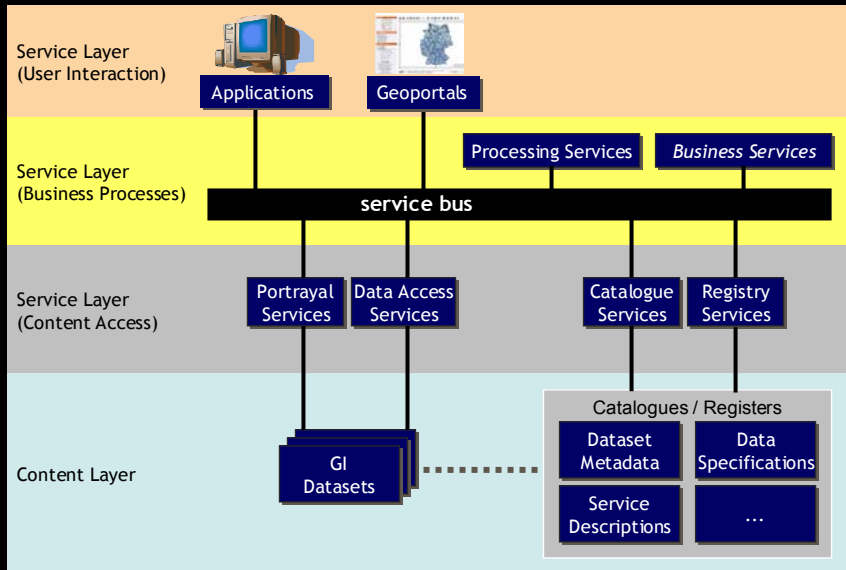
- an iterative process
- well-established requirements
- good understanding of the existing geographic information
- testing and validation

As a result, communities are often aiming at agreed data specifications...



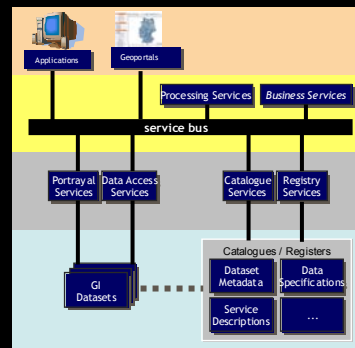
- Data will probably in general still not be linked (not a real web yet)
- Users still need WMS/WFS/... aware clients

Simplified architectural view



Open issues

- Management and publication of all items related to data specifications in standardised registers
- Data specifications are complex/expensive to harmonise → ontologies may/will allow for a greater flexibility in the future
- Maturation of standards
- Intergration of geographic information into IT mainstream - we need to avoid creating simply a bigger silo



Summary

- Publishing geographic information in SDIs / in the web is working
- Discovering geographic resources is still difficult
- Using geographic information found in the web is often still difficult today - which will be improved by agreed data specifications following a common modelling framework
- Registries are key components for SDIs
- Ontologies are expected to simplify the integration of heterogeneous data in the future
- Geographic information published on the web is typically not yet part of a „geoweb“ - this is mainly not a technical issue
- We need better integration with mainstream IT

Thank you!

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