Connecting Distributed Geoservices: Interoperability research at ITC

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International Institute for Geo-information Science and Earth Observation (ITC)
ITC Research related to interoperability

Knowledge node Distributed Geoservices
- 4 fte, within Department of Geo-Information Processing
- geodata infrastructure, internet / mobile gis (multiscale)

MSc and PhD student projects
- Discovery & chaining of Webservices
- Consuming Webservices

Input in various research projects
- Testbed GeoData Infrastructure (T-GDI) research Rob Lemmens ➔ paper Lemmens / de Vries
- Interoperable Web services for Risk Indicator Maps (SLARIM)
- Cross Border GDI ➔ presentation Lars Bernard
Student project:
Towards a semantic web of GIS components

Building a framework for on-demand chaining of GIS components

- Semantic metadata is core of the framework
- Functional requirements of tools for creating, maintaining and using the framework
- Formalisation of framework
Discovery of Web Services for chaining (prototype)

Registry Information Model
- Database
- Ontologies
  - Service
  - Data
  - Operation
- RDF/XML

Service Registry Server
- Publication
- Inquiry
- XML Parser
  - DOM W3C
  - XSLT W3C
  - Scripts

Search Interface

Publish Interface
Prototype of Service Registry Explorer

- Service Provider: codebump
- Name: GeoPlace
- Service Category: Geocoding
- Operation Implemented: SQL Selection
- Required Data: point
- Spatial Reference: no information
- Input: name of city or street address
- Output: latitude, longitude
- Access Properties: subscribed

Processing:
- Spatial
- Thematic
  - geocoding
  - geoparsing
  - Geoparameter calculation
  - Thematic classification
  - Change detection

Geographic Coordinates:
- City
- Street address
- State
- Country
- Coordinate
- Map coordinates
- ZIP code
ISO 19119 as ontology (Ontoedit)

- Classes (concepts)
- Properties
- Relationships
Student project: Consuming Web Services (ArcObjects example)

User input:
User’s location name & POI type

Web Service

Encode jpeg

Web server (IIS + .NET framework)

Local machine (Windows 2000)

Database:
User location/POIs names & coordinates,

ArcObjects:
Query POI type
Calculate shortest distance, create map

Shell

Map (jpeg)

Decode jpeg

AD0: Location coordinate lookup

Web enabled Windows application (.NET)
Student project: Consuming Web Services (SVG example)

Web application (.NET)

Web server (IIS + .NET framework)

Local machine (Windows 2000)

![Diagram of system components and flow]

**User input:**
User’s location name & POI type

**Web Service**

**Database:**
User location/POIs names & coordinates,

**Find nearest POI,** and convert both user’s location and POI’s location into SVG format.

**Compile resulted SVG format data with original SVG data, generate a new SVG file.**

**ADO:** Location coordinate lookup

**SVG file generated with FME**

! This Step still under coding process
Testbed Geospatial Data Infrastructure
Web services scenario - example

Disaster event: “Is this place in danger?”

Distributed web services

Mobile
- GPS
- Crd transf

Local office
- Your location:
  - Street address
- Geocoding
- Your location (X,Y)

Hazard database
- Spatial analysis
- Local hazard dataset
- Visualisation

Local hazard map
- Local office
- Mobile

Crd transf
- GPS
- Mobile
- Local office
SLARIM project

Strengthening Local Authorities in Risk Management

- methodology for the implementation of risk assessment and spatial decision support systems
- for risk management by local authorities
- flood and earthquake threatened urban areas
- directed towards the needs of medium sized local authorities in developing countries
- ITC staff-members input supported by visiting scientists and PhD research
Online mapping of risk indicators

Methods:

• Cartographic design of risk indicator maps (RIMs)
• Technical concepts of RIM Web services

In order to design RIMs, one needs:

• Analysis of geospatial risk data (from other WPs)
• Cartographic grammar for visualisation of (real and perceived) risks
  • Theoretical review (eg. of perception properties)
  • Best practices review (real solutions)
Interoperable Web services for Risk Indicator Maps (SLARIM WP3300 + 3500)

Interoperability aspects and visualisation

Keywords:

- On-line, distributed data
- Scalable (ranging from in-office planning to rapid response in the field)
- Time-aware (comparisons, real-time, extrapolation)
- Distributed processing, interoperability research and the impact of OpenGIS specs

⇒ XML-based solutions (GML, SVG for visualisation)
(GML, XHTML, Xforms, SVG, etc...) = XML
Thank you for your attention!

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