Web services for spatial data transformation and exchanges in SDI:
a prototypical implementation of the LPIS Quality Assurance Test Bed Services

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Outline

- Introduction
  - CAP, IACS and LPIS
    - LPIS QA: Abstract Test Suite & Executive Test Suite
- Schema transformation service for LPIS
  - Architecture
  - Implementation
- Content validation service for LPIS
- Linkage to INSPIRE
- Conclusions and further research
CAP, IACS, LPIS

European Commission

Member State administration

Farmer

DG AGRI / CAP

1st pillar €41bn/yr
SPS / SAPS + direct aid

2nd pillar €15bn/yr
Rural Development

DG ENV

Environment directives

DG SANCO

Public/Animal health&welfare

Integrated Administrative and Control System

Communicate content of LPIS to the farmer
provide service for e-application

Control farmer’s application / eligibility / area declared / cross-compliance

Land Parcel Identification System (LPIS)

Geospatial data through web services

Submit yearly declaration

Make 5 years commitments

Respect X Compliance
A well functioning LPIS (= single GIS for IACS)

- good localisation
- correct quantification of eligible area
- greatly facilitates operations by farmer, inspector and paying agency,

→ a better performance, a higher efficiency
- a reduction of inspections (for both eligibility and cross-compliance)
- lower IACS operating costs for the member states

→ substantially reduced risks for the EU Funds
→ good information to the farmer

Comm. Reg. EC (no) 1122R2009 art. 6.2: annual assessment by MS, based on ISO 19105: Conformance and testing
CAP Regulation sets up the requirements but does not provide instructions on conception and implementation of the LPIS by Member states

- Many different solutions and designs emerged
- Every Member State has its own implementation of the LPIS database

Need for harmonisation of LPIS

- LPIS Core Model: CAP Regulation translated into the geoinformation realm
LPIS QA: ATS & ETS

**National Implementation**

- **Input**
  - Application Schema
  - Feature Catalogue

**Transformation**

- **Input**
  - Imagery
  - Vector data
  - ... 

- Model conformance test
  - Abstract Test Suite (ATS)

- Data conformance test
  - Executive Test Suite (ETS)

**LPIS Core Model**

- Analysis of results

- **Output**
  - Conformance Test Report
Aim of schema mapping and transformation:
- Ensure the exchange of LPIS data in a standardized way
- Simplify communication to the responsible EU authority
- Ensure that appropriate data will be submitted for inspection

Starting point for a prototypical implementation:
- LPIS data is provided via OGC WFS interface following an arbitrary LPIS GML application schema
- Target schema defined by the LPIS Core Model
Software components:

- FME Desktop – to interactively model complex schema and format mapping processes
- Python – to describe the transformation rules (script is invoked by the FME transformation process)
- FME Server – to access and run previously created FME mapping scripts (Java API allows for wrapping by the standardized OGC WPS interface)
- 52°North WPS – to implement the mediator WPS instance between the web client and the FME Server
- GeoServer WFS – to provide LPIS datasets for schema transformation as well as additional datasets for intersections via the OGC WFS interface.
Aim is to ensure completeness and validity of ETS observations

- Check against previously defined constraints (e.g. defined in XML schemas)
  - Data structure
  - Mandatory elements and attributes
  - Attribute values
  - Consistency of spatial data

- Result stored in a spatially enabled database

- Service functionality wrapped by the OGC WPS interface
Setup follows the general idea of the INSPIRE network service architecture

Most of the requirements for INSPIRE Transformation Network Services fulfilled:

- Use of GML application schemas
- Mapping descriptions stored separately from the process in a mapping repository
- Compliance with architectural constraints (open interface, statelessness, parameter by reference, schema agnostic interface, automated process, mapping flexibility)
- Demonstrated feasibility of the chosen SDI-approach for LPIS Quality Assurance

- Aim: integration of the proposed services in a prospective geoportal implementation for LPIS

- Further development:
  - Consider the propagated technical solutions for INSPIRE (e.g. WSDL/SOAP, RIF)
  - Generic service profiles for schema transformation and content validation (facilitate interoperability)
  - Improve service security, robustness and usability
Thank you for your attention!