Building bridges from INSPIRE to e-Government: a common RDF vocabulary for INSPIRE and Governing Persistent Identifiers for location

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Overview

• Background to the work
• Governing Persistent Identifiers (PID)s-brief
• Resource Description Framework (RDF) vocabularies for INSPIRE
• Next steps

• Thanks to the experts!
... building bridges in INSPIRE and between INSPIRE & other sectors

http://thevictorianist.blogspot.it/2012/01/like-painting-forth-bridge-or-greatest.html
1. Evidence about the current status in Europe of linked (geospatial) data related to INSPIRE.
2. An initial common/agreed methodology and guidelines towards RDF encodings for INSPIRE.
3. Recommendations for how location PIDs could be governed for INSPIRE and other relevant activities.

- Many countries and project had started work but we wanted to take stock and look into common approaches etc.
Webinars

A Reusable INSPIRE Reference Platform

RDF and PIDs for Location: Preliminary results

Submitted by Alice Vasiliscu on April 16, 2014

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Motivation
INSPIRE is focusing on addressing the interoperability of geospatial data sets and services through the creation of data models (using UML) and geospatial encodings mechanisms (using GML), for the exchange of data related to one of the 34 spatial data themes defined in the INSPIRE Directive. In contrast, e-Government applications and tools usually use

https://joinup.ec.europa.eu/community/are3na/event/rdf-and-pids-location-preliminary-results
**PIDs GOFA model**

**Governance**
- **PID Policy**: Defines what and how can be assigned a PID
- **PID Organisational structure**: Defines who has the authority and control (planning, monitoring and enforcement) over the management of PID

**Operations**
- **Registration**: Creates and registers PID
- **Validation**: Validates the format, location and the uniqueness of PID
- **Redirection**: Uses persistent PID to redirect to the desired Web resource
- **Long Term Preservation**: Archives fullback copies of “dead” resources

**Business Case**
- Justifies the investment in persistent identifiers

**Cost Model**
- Defines the allocation of costs and charges associated with the provision of persistent PID

**PID Naming and Design rules**
- Defines and formalises how to design persistent PID

**Service Model**
- Describes the set of services that will benefit from the use of persistent PID, this encompasses both data and metadata about services

**Financing**

**Architecture**

A Reusable INSPIRE Reference Platform
UML to RDF transformation issues

- Closed world of UML versus open world of OWL?
- Mapping concepts in UML and related concepts in existing RDF vocabularies
- UML has some restrictions such as cardinality
- How should geometry be encoded in RDF? Which standards? What about temporal reference systems?
- How to deal with versioning and lifecycle information in OWL?
- How to deal with the concept of voidability?
Methodology: INSPIRE schemas to RDF

- Experts draft their methodologies and meet in a one-day workshop to compare, discuss etc.
- Apply methodology to three INSPIRE Annex Themes
- Describe potential transformation tools to generate RDF vocabularies (source + INSPIRE).
- Outline open issues/obstacles for the proposed methodology
## Tested INSPIRE themes

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Relevant standards and specifications

- **ISO/DIS 19150-2 – Geographic information — Ontology — Part 2: Rules for developing ontologies in the Web Ontology Language (OWL)**
  - Schema conversion rules are starting point
  - Almost finalised
  - Shows strongly UML roots and do not really reflect common practice in the linked open data world

- **Other relevant standards**
  - ISO/DIS 19103:2013 (Conceptual Schema Language),
  - ISO/DIS 19109:2013 (Rules for application schema),
  - Cool URIs for the Semantic Web- http://www.w3.org/TR/cooluris/
  - INSPIRE Generic Conceptual Model, INSPIRE Guidelines for the encoding of spatial data
  - GeoSPARQL, NeoGEO, FOAF, ORG, Location Core, Person Core.
Spatial objects vs real-world things

GI models tend to mix information about the real world object with metadata about the abstraction of the real world object

e.g. In a railway station (class) you would have data belonging to that place (number of platform etc.) but also metadata about the lifecycle of the object
Further example

**Spatial Object:** abstract representation of a real-world phenomenon related to a specific location or geographical area [INSPIRE Directive]

Synonymous with "(geographic) feature" as used in the ISO 19100 series.

From: INSPIRE Generic Conceptual Model D2.5 v3.3

Source: Stuart Williams
Spatial objects as graphs and nodes

http://example.com/ont/inspire/examples/id/{id}
or
http://transport.data.gov.uk/id/station/MAN

http://example.com/ont/inspire/examples/doc/{id}
Specific conversion rules

- Properties and integrity constraints (domain and ranges, cardinality)
- Representing features in RDF
- Codelists
- Versioning of features
- Voidability
- Lifecycle information and other metadata
- Foundation schemas
- External vocabularies
Conclusions

- Good start in both RDF and PIDs but further development and testing are needed to have common approaches.

- RDF vocabularies that strongly show UML roots do not really reflect common practice in the linked open data world.
- Any automatically generated RDF vocabulary will require reviewing and additional edits due to their specific context.
- Common practice needed with respect to the use of external vocabularies e.g. geometry representation in RDF. Dependency on other communities.
- Require broader review and discussion as well as testing in applications.

- Good guidance and examples are needed that illustrate how feature instances should be represented in RDF, as this information is not immediately accessible from the RDF vocabularies.
  - Not all the UML is being used, offering greater freedom
Next steps

• The reports will be shared with the MIG and ISA Working Group, then published after the summer.
• Interested in further testing of methodology and other themes and looking for volunteers/ongoing projects
• Looking at how specific examples could be taken forward as part of the ARE3NA platform.

• What other tools are being used for RDF conversion?
  ▪ p.s. do not forget to fill in and return our super-short survey to the JRC stand ;)
For more information
http://ec.europa.eu/isa/actions/01-trusted-information-exchange/1-17action_en.htm

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