Promoting semantic interoperability between public administrations in Europe

ISA solutions, Brussels, 23 September 2014
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What semantics is about?

ISA work in semantics

Scope of the visit
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\[\exists x \Phi(x) \quad \forall x \rightarrow (P \rightarrow Q)\]

\[
a) \forall x(Bx \rightarrow Cx), \forall x(Ax \rightarrow Bx) \vdash \forall x(Ax \rightarrow Cx)
b) \exists x(Ax & \neg Px), \forall x(Bx \rightarrow Px), \exists x(Ax & \neg Bx)
c) \forall x(Px \leftrightarrow Qx), \exists x \neg Qx \vdash \exists x \neg Px
d) \forall x \forall y(Ax & By) \vdash \exists x(Ax & Bx)
e) Na \rightarrow \forall x(Mx \leftrightarrow Ma), Ma, \neg Mb \vdash \neg Na
f) (Pa \lor Qb), (Qb \rightarrow b = c), \neg Pa \vdash Qc
g) (m = n \lor n = o), An \vdash (Am \lor Ap)
h) \exists x Px, \exists y \neg Py \vdash \exists x \forall y x \neq y\]
Semantics

“Now! ... That should clear up a few things around here!”
How do we achieve technical interoperability?
What semantics is about?

ISA work in semantics

Scope of the visit
Making visible existing solutions

ADMS & Catalogue of semantic standards
• Using the same semantic standards promotes interoperability

• By reusing what is available you save resources, you reduce risks, and you become more interoperable with others

• A large number of semantic standards already exists
The existing solutions are scattered in numerous places and are very difficult to find

- Several national initiatives to create repositories/libraries/catalogues of semantic standards (e.g. Germany, Denmark, Finland, Estonia...)
- Standardization bodies and third party initiatives generate valuable and highly reusable specifications (e.g. OASIS, W3C, UN/CEFACT...)
- Independent projects make available semantic standards to their own websites
How could we promote the visibility and reuse of existing semantic standards at the European level?
How could we promote the reuse of existing semantic standards at the European level?

... by agreeing on a common language (template) to describe semantic standards

... creating a yellow page infrastructure with standards descriptions and links to the actual standards
Common template (metadata) for describing semantic standards

Asset Description Metadata Schema (ADMS)

May 2012: ADMS endorsed by the EU member states (ISA Coordination Group)
ADMS implementation

- Semantic standards are described using ADMS
- Features simple and advanced search of semantic standards
- 2000+ semantic standards from 25 repositories are currently searchable through Joinup

Since January 2013
European Federated Interoperability Repository (EFIR)

- Interoperability solutions are described using ADMS
- Features simple and advanced search of interoperability solutions
- Semantic and technical standards, open source software, reusable services

By end 2014
Making visible existing solutions

Establishing agreements on basic semantics

ADMS & Catalogue of semantic standards

Core Vocabularies
"...What has been discovered over the years is that there are a number of (information) structures that are universal and applicable to all kinds of organizations, both private and public. There are four fundamental categories: People and Organizations, Geography, Physical Resources and Activities and Events"

*David Hay, Describing the World: Data Patterns*
Core vocabularies

Simplified, re-usable, generic and extensible data models that capture the fundamental characteristics of a data entity in a context-neutral fashion.
Usage

- New systems: As default starting points for data modeling
- Existing systems:
  - As reference data models for integration and information sharing
  - As export specifications for publishing open data
Making visible existing solutions

Establishing agreements on basic semantics

Improving interoperability of open data

**ADMS & Catalogue of semantic standards**

Core Vocabularies

DCAT-AP
150+
Existing OGD Portal
How can I find and combine public data from various sources?
The DCAT Application profile (DCAT-AP) is a common template to describe public sector datasets and data catalogs.
2013: pilot of a pan-European Open Data Portal

2014-2020: progressive implementation as one of the CEF (Connecting Europe Facility) Infrastructures (Open Data)
Making visible existing solutions

Establishing agreements on basic semantics

Improving interoperability of open data

Raising awareness on semantic interoperability and metadata management

ADMS & Catalogue of semantic standards

Core Vocabularies

DCAT-AP

Communities

Studies

Visits
Develop a national catalogue of core data standards (I)

1. Identify highly reusable information entities which remain relevant across different government domain
   - *Examples from DK, USA, DE, JP: person, business, locations*
   - *Rule of thumb: this data is stored in base registries*

2. Model this information to create generic data models and define reference data values. Use standard modeling approaches (e.g. UML, XML, RDF) and reuse existing content standards whenever possible (e.g. ISA Core Vocabularies, UBL)
   - *Example: the OSLO data standard for local authorities*

3. Develop and maintain a library of these core data standards. Promote this library as an authoritative source of core data elements (objects, properties, values)
   - *Examples: Germany-KOSIT, USA-NIEM, Japan-Core Vocabularies*
4. Develop tools to a) allow easy reuse of the models published in the library, b) validate compliance with the core library
   - Examples: Germany-KOSIT, USA-NIEM

5. Provide space for organic growth of domain specific libraries around the core library. Allow domain-specific communities to contribute and share their (core library-compliant) models.
   - Examples: Germany-KOSIT, USA-NIEM

   - Examples: 23 repositories already have used ADMS to describe their assets including Germany - Xrepository, Estonia - RIHA, the Netherlands - Dutch Standardisation Forum, Belgium - Belgian Interoperability Catalogue, Denmark - Digitalisér.dk.

7. Develop a national government metadata and standards policy (e.g. “comply or explain”)
Questions

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