Integrating Metadata Repositories into the Web of Data

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12th November 2012
• Definitions and Motivation:
  o Semantic Interoperability
  o Semantic Interoperability Asset
  o Asset Repository
• Challenges
  o Asset Repository Integration
• Methodology
  o Repository Study
  o ADMS
  o Repository Federation
• Lack of commonly agreed and widely used data models.

• Absence of common reference data.
"Semantic interoperability enables organisations to process information from external sources in a meaningful manner. It ensures that the precise meaning of exchanged information is understood and preserved throughout exchanges between parties"
Assets are any technical, legal or organisational resource that can reused within and outside public administration and governments body to facilitate interoperability.
SEMANTIC INTEROPERABILITY ASSETS

- List of the Irish counties
- Electoral Divisions
- W3C Standards, e.g., SKOS, OWL, RDF, etc.
- Core Vocabularies, i.e., Core Person, Core Location and Core Business.
- Geo-spatial References
- Ontologies
- Codelists
A **Semantic Asset Repository** is a system or service that provides facilities for storage and maintenance of descriptions of Semantic Assets and Semantic Asset Distributions, and functionality that allows users to search and access these descriptions.

### XÖV-Vorhaben (21)

<table>
<thead>
<tr>
<th>Datum</th>
<th>Titel</th>
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<tbody>
<tr>
<td>11.09.2012</td>
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<td>29.08.2012</td>
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<td>26.09.2012</td>
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<td>25.09.2012</td>
<td>Destatis.Staatsgebiete (v2012-09-01)</td>
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<td>25.09.2012</td>
<td>Destatis.Staatsangehörigkeit (v2012-09-01)</td>
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<tr>
<td>12.09.2012</td>
<td>DSRV-Fehlerkatalog (v2012-05-01)</td>
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</table>

### Hilfe

- Neuen Inhalt ins XRepository einstellen
- zur Übersicht
DERI Vocabularies

DERI Vocabularies is a URI space for RDF Schema vocabularies and OWL ontologies maintained at DERI, the Digital Enterprise Research Institute at NUI Galway, Ireland. The site is operated by DERI's Linked Data Research Centre. Read more...

Schema.org CSV

Author: Michael Hausenblas
Mapping vocabulary for CSV files that use Schema.org terms in the header.
Namespace URI: http://purl.org/NET/schema-org-csv#
Terms: 3 Classes, 2 Properties

kaon, the Knowledge Attribution Ontology

Authors: Aidan Hogan, Jodi Schneider
kaon, the Knowledge Attribution Ontology, is an ontology for characterizing the certainty of information, how it is known, and its source
Namespace URI: http://vocab.deri.ie/kaon#
Terms: 3 Classes, 7 Properties

ODApp documentation

Fri, 07/13/2012 - 13:48 — fadmua
Model overview at: http://vmsgov03.deri.ie/ODApp-overview-3.png
Example:
**CHALLENGES**

- **Challenge 1:** facilitating the reusability of semantic assets stored in government metadata repositories across the Web.

- **Challenge 2:** Integration of these heterogeneous and distributed repositories.

> "It is the unexpected re-use of information which is the value added by the web"

Tim Berners-Lee
METODOLOGY

Metadata Description Schemata Study

Study the state of the art of metadata description schemata

Metadata Description Models

RDF-based

Type-specific

VOAF
OMV
KOS
DCAT

Generic

SKOS

DCAT

DC-based

NZGLS

e-GMS

ISO-based

CLF

CORES

DESIRE

Example

Has Part
METODOLOGY

Metadata Description Schemata Study
Study the state of the art of metadata description schemata

Repository Analysis
Study the available government repositories in Europe, in terms of:
- Content
- Meta-models
- Technologies and access mechanisms

Exchange Model
Asset Description Metadata Schema (ADMS)

ADMS Exchange API
Define the ADMS Exchange API and build the ADMS-enabled federation
**METHODOLOGY**

- **Metadata Description Schemata Study**
  - Study the state of the art of metadata description schemata

- **Repository Analysis**
  - Study the available government repositories in Europe, in terms of:
    - Content
    - Meta-models
    - Technologies and access mechanisms

- **Exchange Model**
  - Asset Description Metadata Schema (ADMS)

- **ADMS Exchange API**
  - Define the ADMS Exchange API and build the ADMS-enabled federation
The Asset Description Metadata Schema (ADMS) is developed to deliver a common meta-model for semantic assets.
http://www.w3.org/TR/
adms:Repository http://www.w3.org/TR/skos-reference/
adms:Asset
http://www.w3.org/2004/02/skos/core.rdf

adms:Distribution
ADMS-ENABLED FEDERATION

The ADMS Exchange API, is built to:

i. Retrieve ADMS descriptions of semantic assets from distributed repositories.

ii. Keep the federation data up-to-date.

Design Principles:

i. REST architectural style.

ii. Linked Data representation.
## API Specification

<table>
<thead>
<tr>
<th>Resource</th>
<th>HTTP Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>repository</td>
<td>GET</td>
<td>a representation of the repository using native ADMS</td>
</tr>
<tr>
<td>assets</td>
<td>GET</td>
<td>a representation of a collection of assets</td>
</tr>
</tbody>
</table>

```<http://vmudi205.deri.ie:8080/digitaliserapis../repository> a :SemanticAssetRepository;  
dct:created "20011026T21:32:52"^^xsd:dateTime;  
dct:description "Digitaliser.dk"@en;  
dct:modified "20011026T21:32:52"^^xsd:dateTime;  
admsapi:assets <http://vmudi205.deri.ie:8080/digitaliserapisserver/adms/assets>;  
rdfs:label "Digitaliser (Denmark)";  
:accessURL "http://api.digitaliser.dk/rest";  
:supportedSchema "1.0" .```
Support of Pagination: Calling asset collection URI of a big repository, the server redirect the call to the first page of assets, e.g, `<AssetCollectionURI>?firstpage:

```xml
@prefix rdf:<http://www.w3.org/1999/02/22rdfsyntaxns#>.
@prefix bp:<http://openservices.net/ns/basicProfile#>.
@prefix o: <http://example.org/ontology/>.
<http://example.org/netW/nw1/assetCollection> a bp:Container;
<http://example.org/netW/nw1/assetCont?firstPage> a bp:Page;
bp:pageOf <http://example.org/netW/nw1/assetCollection>;
```

Support of Synchronization: A date parameter that can be associated with asset collection URI, e.g, `<AssetCollectionURI>?date=date_of_last_call.`
<table>
<thead>
<tr>
<th>Access mechanism</th>
<th>Digitaliser.dk</th>
<th>DERI Vocabularies</th>
<th>ESD Standards</th>
<th>Joinup</th>
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</thead>
<tbody>
<tr>
<td>Access mechanism</td>
<td>REST</td>
<td>URIs</td>
<td>SPARQL endpoint</td>
<td>N/A</td>
</tr>
<tr>
<td>ADMS Support</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
ADMS Federation Prototype

http://vmudi205.deri.ie:8080/apiclient/home
What are the benefits of the ADMS-enabled federation of semantic assets?

- Increase the visibility of semantic assets
- Stimulate the reuse of semantic assets
- Discovery of the appropriate semantic assets
- Reach a wider audience
- Easier understanding of semantic assets
- Increased value of semantic assets
- No direct benefits

http://joinup.ec.europa.eu/community/cesar/home
RECAP & ACKNOWLEDGMENTS

- ADMS Working Group & JoinUp

- ADMS on the Government Linked Data Working Group (GLD) charter.

- ADMS is adopted by many repositories throughout Europe, i.e. W3C, Digitaliser.dk and Listpoint.

- More than 400 downloads.

- JoinUp Exchange API recommendation.
FUTURE WORK

- ADMS Standardization
- Automating the mapping process between host repositories models and ADMS.
- Including more repositories in the federation.
- Harvest metadata from RDFa sources.
- Crawling instead of manual registration.
ADMS V1.0 recently published.
https://joinup.ec.europa.eu

Community of European Semantic Assets Repositories

**Keywords:** federation, semantic asset repository, semantic assets

**Domains:** Information Society (other), Internet

The Asset Description Metadata Schema (ADMS)

**Keywords:** federation, metadata, semantic asset repository

**Domains:** Internet


• Shukair, G., Loutas, N., & Peristeras, V. Integrating Linked Metadata Repositories into the Web of Data. 3rd International Workshop on Consuming Linked Data (COLD2012), ISWC November 2012 - Boston, USA.