SEMIC

SEMANTIC
INTEROPERABILITY
CONFERENCE

2012

Explore semantic technologies
for improved interoperability &
e-Government services

Conference Highlights

https://joinup.ec.europa.eu/event/semic-2012-semantic-interoperability-conference-2012

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Introduction

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The Semantic Interoperability Conference 2012 offered a unique opportunity to explore and discuss how semantic interoperability solutions are being embraced by e-Government initiatives

We are witnessing a plethora of initiatives to make the interactions between public administrations, business and citizens more efficient and effective. To name a few: the Actions of the Digital Agenda for Europe, the Actions of the Interoperability Solutions for European Public Administrations Programme, the Large Scale Pilots, etc.

The Semantic Interoperability Conference 2012 – SEMIC 2012 – offered a unique opportunity to explore and discuss how semantic interoperability solutions are being embraced by e-Government initiatives. The conference combined plenary sessions and interactive panels in an inspiring networking atmosphere.

e-Government and semantics experts presented their case studies and real-life examples and experiences with semantic technologies.

isa
Interoperability Solutions for
European Public Administrations

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Conference in figures

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139
participants
From 35 different countries

Sweden

Norway

Estonia

United Kingdom

Lithuania

Denmark

The Netherlands   Germany   Poland

Belgium   Czech Republic   Slovakia

France   Austria   Hungary

Romania

Croatia

Spain   Bulgaria

Cyprus

Portugal   Italy   Greece

+ Australia, Brasil, Canada, Japan, Taiwan, Tunisia, USA

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66
participants
From Public administrations
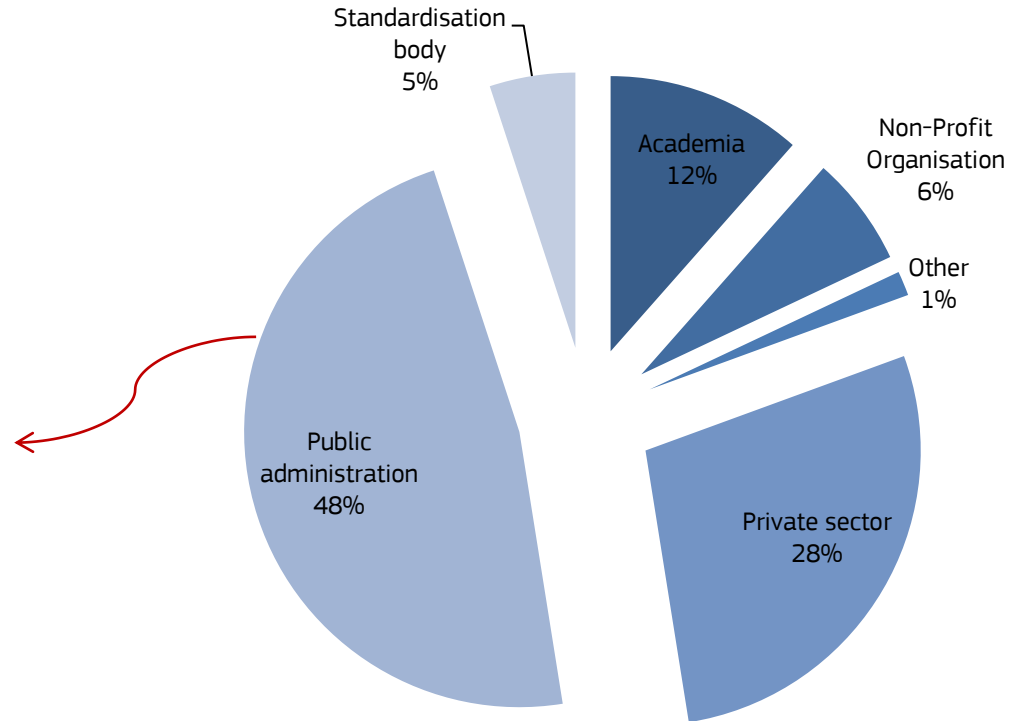
Standardisation
body
5%

Academia
12%

Non-Profit
Organisation
6%

Other
1%

Public
administration
48%

Private sector
28%

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Highlights

Keynote Talk - NIEM – National Information Exchange Model

Anthony Hoang

U.S. Dept. of Homeland Security - DHS, National Information Exchange Model (NIEM)

"Information Exchange Package Descriptions are developed and maintained by communities of domain experts."

Anthony Hoang explained how NIEM is structured and what the benefits are.

What is NIEM?

NIEM connects communities of people who share a common need to exchange information in order to advance their mission, and provides a foundation for seamless information exchange between federal, state, local and tribal agencies. Much more than a data model, NIEM consists of an active *user* community as well as a technical and support framework.

How does NIEM work?

The NIEM governance structure contains three committees: the Communications and Outreach Committee, the Technical Architecture Committee and the Business Architecture Committee . These committees are supported by the NIEM Programme Management Office and only offer the methodologies and the tools. The Information Exchange Package Descriptions (IEPD) are developed and maintained by the communities of domain experts. Every domain is stewarded by a domain leader.

Use Case

As abuse and diversion of prescription drugs escalate, law enforcement and health practitioners need a standardized, scalable solution to share patient drug history. The Standard NIEM Prescription Monitoring Program Information Exchange (PMIX)assists prescribers, health agencies and law enforcement in identifying potential abuse and diversion.

ISA Core Vocabulary to NIEM mapping

The NIEM PMO has provided a mapping of the NIEM Core data model with the ISA Core Vocabularies (Core Business, Core Location and Core Person). Out of 56 elements there were:
- 45 concepts having a direct match;
- 4 concepts having no match;
- 2 concepts having partial matches;
- 3 concepts that were uncertain.

Link

https://www.niem.gov/Pages/default.aspx

Highlights

ADMS, Federation and Core Vocabularies

Vassilios Peristeras

EC Interoperability Solutions for Public Administrations (ISA) Unit, Programme Manager

"In the ISA Programme, we try to reach and then promote common agreements on how we describe and model fundamental entities like a person, business and location for the first time at a European and cross-domain level."

Vassilios Persiteras outlined the development of the Asset Description Metadata Schema (ADMS) and three Core Vocabularies (Core Person, Core Location, Core Business).

ADMS Business value

The main business value of ADMS is increasing the visibility of semantic standards that already exist, promoting reuse of existing solutions and identifying areas where alignment and agreements to use compatible specifications are possible and/or necessary.

Core Vocabularies

A Core Vocabulary is a simplified, reusable, and extensible data model that captures the fundamental characteristics of an entity in a context-neutral fashion. From November 2011 till May 2012, ISA has developed three core vocabularies: Core Location, Core Person and Core Business.

Next steps

ADMS and the three Core Vocabularies were endorsed by the EU Member State Representatives in the ISA Programme and this means that the Commission will further promote, disseminate and exploit them. Furthermore, ADMS and the three Core Vocabularies specifications entered the W3C standardization process to evolve to global standards.

Links

https://joinup.ec.europa.eu/elibrary/video/towards-open-metadata-management-promo-video-adms-enabled-federation-repositories – video about the ADMS enabled federation

https://joinup.ec.europa.eu/elibrary/document/towards-open-government-metadata – White paper: "Towards Open Government Metadata"

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Putting ADMS into practice, the case of the German XRepository

Andreas Gehlert
Federal Ministry of the Interior, Enterprise Architect

"From XRepository's viewpoint, the main benefit of using ADMS is visibility and marketing ("XRepository goes Europe")"

Andreas Gehlert introduced the German XRepository platform, the German repository for semantic standards.

What is XRepository?

The XRepository is the database for Germany's semantic standards. The platform aims to improve semantic interoperability and semantic harmonisation. Standardization projects use it as a distribution platform for their work. The platform and content is open to everyone. The XRepository now has an ADMS Export Component which enables the export of ADMS-compliant asset descriptions.

What are the principles?

Sharing of semantic standards is voluntary. However, some semantic standards are referenced or required by law.

Added value of ADMS for XRepository

From XRepository's viewpoint, the main benefit of using ADMS is marketing ("XRepository goes Europe"). Other benefits are the sharing and reuse of the content with a broader community, the discovery and reuse of standards from other European Member States and the increase of interoperability of German e-Government services across Europe.

Link

https://www.xrepository.deutschland-online.de/ - XRepository

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Panel discussion - Towards Semantic Standards

Margarida Abecasis, EC DIGIT.B2, Interoperability Solutions for Public Administrations (ISA) Unit, Head of Unit

Question 1: What are the key success factors of good semantic standards?

• **Milan Zoric (ETSI)**: A good standard addresses a real problem at the right time.

•**Edmund Gray (CEN/CENELEC)**: A good standard has an active community behind it that builds consensus and implements it.

•**John Borras (OASIS)**: A good standard is an open standard. Standards must also be as simple as possible, not too costly to implement and appropriately address semantics to avoid interpretation conflicts.

• **Tim McGrath (UN/CEFACT)**: A good standard is a *de facto* standard not necessarily a *de jure* standard. All good standards become *de facto* standards.

• **Jos Van Hillersberg (University of Twente)**: We do research on criteria to assess the Quality of Semantic Standards. Some of these criteria allow to objectively measure a standard's quality.

• **Thomas Roessler (W3C)**: A good standard is a standard that has is used and is reusable.

Question 2: What will change and what are trends in the field of semantic standards?

•**John Borras (OASIS)**: We are very enthusiastic about the work on ADMS and the Core Vocabularies. OASIS plans to publish its standards using the ADMS vocabulary by the end of 2012.

•**Thomas Roessler (W3C)**: Semantic standards are needed, not only to harmonise the data models used to publish datasets, but more importantly to align the concepts represented within the data. Vocabularies like SKOS can be extremely helpful in this domain. At the same time, we see that semantic standards such as RDF and SPARQL easily allow combining data from heterogeneous sources. For example, it took us (W3C) little time to publish the specifications in the w3.org/TR namespace as open data using the ADMS vocabulary.

• **Edmund Gray (CEN/CENELEC)**: We see that the constant evolution of the Web has an impact on standardisation processes and how communities are working together.

From the audience: we have concerns about the quality of the various standards, the multiplication of initiatives, and communication with the business.

All panellists concluded that standards bodies have to address fragmentation of effort by increased collaboration and reuse. Standardisation processes must safeguard that all stakeholders are represented and that their concerns are adequately addressed.

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Keynote Talk – Semantic technologies and open data

Jeanne Holm

Data.gov, U.S. General Services Administration, Evangelist for Data.Gov

"Data.gov allows you to easily find and retrieve data, but also visualisation is one of the elements of the platform."

Jeanne Holm presented Data.gov, a repository for datasets published by US Federal and local government agencies.

Data.gov

Data.gov contains a wide variety of data. Most of the data is not physically stored on the platform because it is the intention to keep the data close to the data stewards owning it

Data.gov allows everyone to easily find and retrieve data sets. Visualising datasets is one key element of the platform.

Communities

Communities play an important role for Data.gov. These communities attract innovators, industry, academia and government at federal, state and local levels.

Communities are brought together around things people care about like health, education and safety. Each community has a Challenge area, which is used to spark ideas and innovation using federal data. Also each community has an "Apps" area. These apps help transform data in understandable and meaningful ways, helping people make decisions.

Dat.gov in the future

Asking everyone to work together to set data free, Data.gov sets a further example by moving to an "open government platform" of which nearly all components are, or will be, available as open-source. Data.gov will also transition from using a Dublin Core extension to using the Data Catalog Vocabulary and the Asset Description Metadata Schema (ADMS).

Links
http://www.data.gov/ – Data.gov portal

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A little semantics on the data highway

Bastiaan Deblieck

Tenforce, Business Unit Manager of TenForce's Semantic Technology unit

"What you certainly need when doing an open metadata project is a formal publication process. You also need to understand licensing and its impact, prepare the data so they are qualitatively and master the metadata"

Bastiaan Deblieck explained the approach that TenForce is applying in their open data projects. He stressed that every investment in metadata is valuable, if it focuses on quality.

Initiatives TenForce is involved in.

- LOD2
- CELLAR (Publications Office)
- EC Digital Agenda Scoreboard
- EC Open Data Portal

The approach of an open data project.

A formal publication process is key when carrying out an open metadata project . Also, it is important to understand licensing and its impact. Effort should be put in preparing the data and also the metadata.

What are the elements you need to have for open data?

- CMS or existing publishing system
- Portal to publish on the internet
- Navigation & visualization components
- Thesaurus/taxonomy management
- A place to store your content and/or data
- A place to store your metadata
- Linking & enriching functionality

Link

http://www.tenforce.com/ – TenForce

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Use of semantic technologies for enhancing access to spatial data

Andrea Perego

Joint Research Centre of the European Commission – JRC, Researcher

""Semantic and multilingual heterogeneity of spatial data is one of the key issues to be addressed to enforce semantic interoperability."

Andrea Perego explained the issues concerning the integration of Spatial Data Infrastructures (SDIs). He illustrated a solution to address semantic and multilingual heterogeneity of spatial data by using Semantic Web technologies, developed in the framework of the EuroGEOSS project.

Spatial Data Infrastructure: problems.

SDI's provide metadata and data services for discovery, access, view and use of spatial data resources. The current problem is the fact that there are different communities and terminologies, different representations and access interfaces to data and metadata and no mechanisms to address semantic and multilingual heterogeneity.

Semantic and multilingual heterogeneity

A possible solution to this issue is the exploitation of multilingual/language-neutral vocabularies denoting semantic relationships among the defined terms and with terms defined in other vocabularies. This can be achieved by representing the vocabularies in the SKOS (Simple Knowledge Organisation System) format, and by providing supporting tools for the supervised creation of mappings between different vocabularies.

Developed tools

In the framework of the EuroGEOSS project, three tools have been developed to support thesauri creation and exploitation across the whole resource life cycle: the SKOS Matcher, and the INSPIRE Metadata editor, both developed at JRC, and the thesaurus-browsing component integrated into the EuroGEOSS discovery broker, developed at the CNR – the Italian National Research Council.

Links

http://semanticlab.jrc.ec.europa.eu – JRC
http://www.w3.org/2004/02/skos/ – SKOS
http://semanticlab.jrc.ec.europa.eu/ – SKOS Matcher
http://www.inspire-geoportal.eu/EUOSME – EuroGEOSS INSPIRE Metadata Editor
http://www.eurogeoss-broker.eu/ – EuroGEOSS discovery broker

Use of semantic technologies for publishing and re-using cultural and scientific heritage data

Antoine Isaac

Europeana, Scientific coordinator

"Europeana is the single, direct and multilingual digital access point to the European cultural heritage."

Antoine Isaac presented Europeana and the semantic technology behind the platform's search engine.

What is Europeana?

Europeana is a single, direct and multilingual access point to the European cultural heritage. It now contains 23,5 million objects from more than 2.200 institutions out of 33 countries.

Europeana and metadata

Europeana receives data from different resources in hundreds of formats and in multiple languages. Search in this context becomes a challenge. To tackle this problem, all data provided must currently comply to a flat interoperability metadata set that is used to describe all cultural heritage objects in Europeana. But this simple format is not satisfactory enough, and Europeana has developed a new Europeana Data Model (EDM). This new data model will enable ingesting semantically richer metadata, and

to connect better to other linked data initiatives in the sector—either for publishing or re-using data.

Europeana and multilingualism

Europeana makes it possible to search for something for instance in French and retrieve objects that have metadata in a completely other language (e.g. Russian). This is possible by enriching object metadata with multilingual semantic resources available as linked data, such as the concepts from the GEMET thesaurus.

Links

http://www.europeana.eu – Europeana
http://data.europeana.eu – Europeana Linked Open Data pilot
http://vimeo.com/36752317 – Animation on Linked Open Data for Europeana's network

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Use of semantic methodologies by the Estonian Public Sector

Priit Parmakson

Estonian Information System's Authority, Co-ordinator

"RIHA is the catalogue of Estonian public sector information systems. It facilitates information system planning and operational activities."

Priit explained the need of semantic technologies with three cases. He also presented the structure of the Estonian interoperability framework and the Estonian catalogue, RIHA.

Estonian Semantic Interoperability Framework

The Estonian Interoperability Framework consists of 5 elements:

- Policy
- Methodology
- Tools (RIHA)
- Training program
- Research

All these parts need attention and must support each other.

RIHA

RIHA is the catalogue of the Estonian public sector information systems and contains systems, components, services, data models, semantic assets, etc. The catalogue facilitates information system planning and operational activities. Most of RIHA's content is only available in a human-readable format. The code lists on RIHA will be described using ADMS and shared on Joinup through the ADMS-enabled federation..

Link

https://www.ria.ee/administration-system-of-the-state-information-system/ – RIHA

Panel discussion – Is it the right time to invest in semantic technologies?

EC Interoperability Solutions for Public Administrations (ISA) Unit, Programme Manager

Question 1: Launched in 1999, the Semantic Web seems not yet to have reached sufficient critical mass. Why?

• **Martin Kaltenböck ([Semantic Web Company](#))**: As a Semantic Web vendor and service provider, I can say that we already see a massive uptake of semantic technologies.

• **Philippe Loopuyt ([DG SANCO](#)):** It takes time to bring about such a paradigm shift, not necessarily from a technology point of view, but especially to change the hearts and minds of the people implementing and using it.

• **Bastiaan Deblieck ([Tenforce](#)):** European projects such as the [LOD2](#) project, in which Tenforce is participating, help build critical mass in terms of tool support, competence building, and proof-of-concepts.

• **Antoine Isaac ([Europeana](#)):** It requires a lot of hard work to build consensus in a community on using semantic standards. At Europeana, we spend a lot of energy in seeking alignment with our partners.

• **Pieter Breyne ([PwC](#))**: Another reason might be marketing. Concepts like [Linked Data](#) and [5-stars](#) for open data, which go back no less than 6-7 years, have done a good job in evangelising the Semantic Web's vision.

Question 2: Which format would you prefer for publishing linked open data: XML or RDF?

Pieter Breyne ([PwC](#)): Because XML imposes a strict schema, we favour it in transaction processing systems. RDF has a much more open nature, which

makes it more suitable to integrate data from disparate sources. The latter seems to be the more suitable for publishing open data.

•**Martin Kaltenböck ([Semantic Web Company](#))**: Using RDF to mash-up data from disparate sources in a single triple store can be better achieved using an RDF data model. In the RDF data model terms and individuals can be identified by an HTTP URI that anybody can look-up on the Web. This aspect of *linked data* is extremely beneficial.

Question 3: What should the European Commission and the ISA Programme do by June 2013?

Pieter Breyne ([PwC](#)): The Commission should Keep Things Simple and explain the benefits of interoperability in a very easy way. Another good approach would be to adopt semantic technologies in its own systems.

•**Martin Kaltenböck ([Semantic Web Company](#))**: Show proof of concept of the things developed by the ISA, provide use cases. Start putting it in your own systems.

• **Philippe Loopuyt ([DG SANCO](#)):** Provide a SPOC to be able to have someone to contact if we want to use EC data. Keep It Simple.

• **Bastiaan Deblieck ([Tenforce](#)):** Besides putting a lot of effort in building platforms, also look at vertical integration like data.gov does with their domains.

• **Antoine Isaac ([Europeana](#)):** Provide road shows and trainings for public administrations in the Member States. Also provide a SPOC to be able to have someone to contact if we want to use EC data. Keep It Simple.

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Declan Deasy
European Commission DIGIT.B, Information Systems and Interoperability Solutions, Director

"There is a need to start preparing the next generation of mission critical systems, aimed at long term sustainability. The architecture of these systems should be interoperable and open. Semantic thinking should be in their heart."

Mr. Declan Deasy concluded the conference with three take-home messages:

For the ISA Programme and national administrations

There is a continued need to establish communities of practice to work together about the basics to put in place and to develop narratives and case studies around semantic technologies and interoperability. The ISA Programme will continue to invest in pragmatic and tangible medium-term solutions , giving much attention to governance and the links with the business

For the vendors

There is a strong need for tools to exploit the semantic standards which are already available. Vendors should seize the opportunity to build tools which make it easy for citizens, business and administrations to benefit from semantic technologies.

For practitioners

Start designing the next generation of mission critical systems, aimed at long-term sustainability. The architecture of these systems should be interoperable and open. Semantic thinking should be in their heart. This implies an important change in the way we build systems. Open data should be at the core of the design process. It also implies the need for new skills and hence training.

Join our communities on joinup

ADMS ASSET DESCRIPTION METADATA SCHEMA

CESAR COMMUNITY OF EUROPEAN SEMANTIC ASSETS REPOSITORIES

eGOVERNMENT **CORE** VOCABULARIES

CORE PERSON VOCABULARY

CORE BUSINESS VOCABULARY

CORE LOCATION VOCABULARY

ADMS. SW

http://joinup.ec.europa.eu

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