

DIGIT

Directorate-General
for Informatics



A common metadata approach to support eGovernment interoperability

Makx Dekkers – makx@makxdekkers.com

João Rodrigues Frade – joao.frade@pwc.be

Stijn Goedertier – stijn.goedertier@pwc.be

Nikos Loutas – nikos.loutas@deri.org

Vassilios Peristeras – vassilios.peristeras@ec.europa.eu

Gofran Shukair – gofran.shukair@deri.org



EUROPEAN
COMMISSION



European public electronic services

Semantic Interoperability

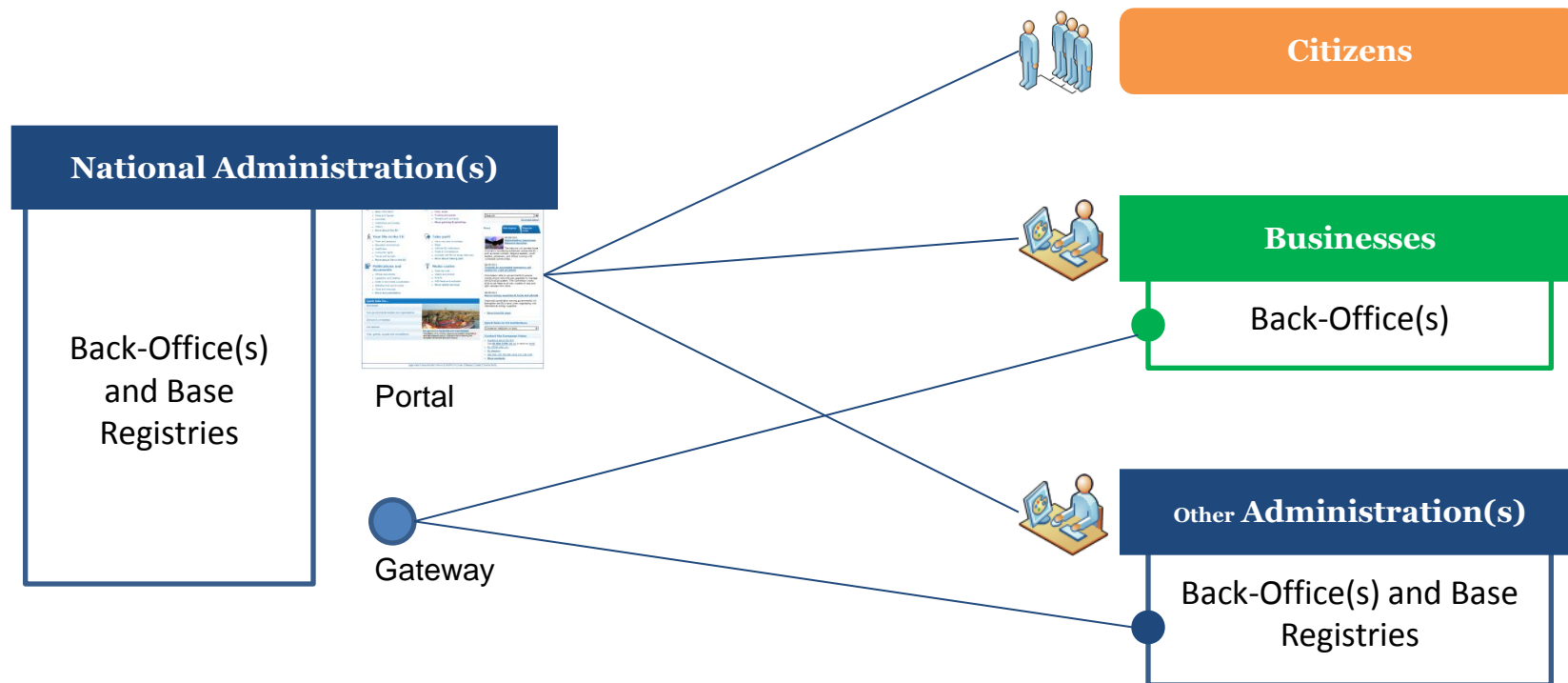
SEMIC

Semantic Web

ADMS

ADMS Prototype

Roadmap



Source: European Interoperability Framework



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics



Are not yet interoperable

Semantic Interoperability

SEMIC

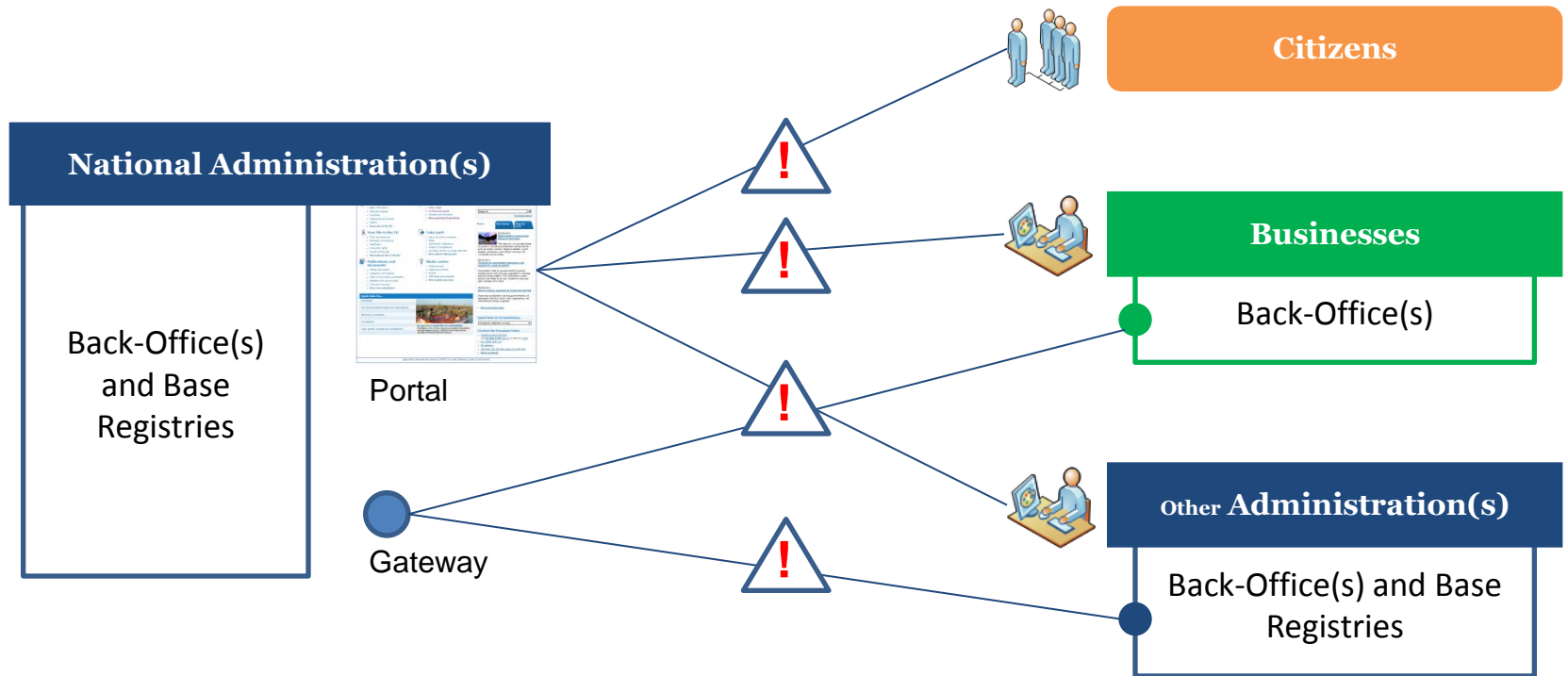
Semantic Web

ADMS

ADMS Prototype

Roadmap

Different metadata and reference data cause **semantic gaps**.



Affecting interoperability between Member-States and Sectors

Source: European Interoperability Framework



EUROPEAN COMMISSION

DIGIT

Directorate-General for Informatics



Semantic interoperability: meaningful exchange of information

Semantic Interoperability

SEMIC

Semantic Web

ADMS

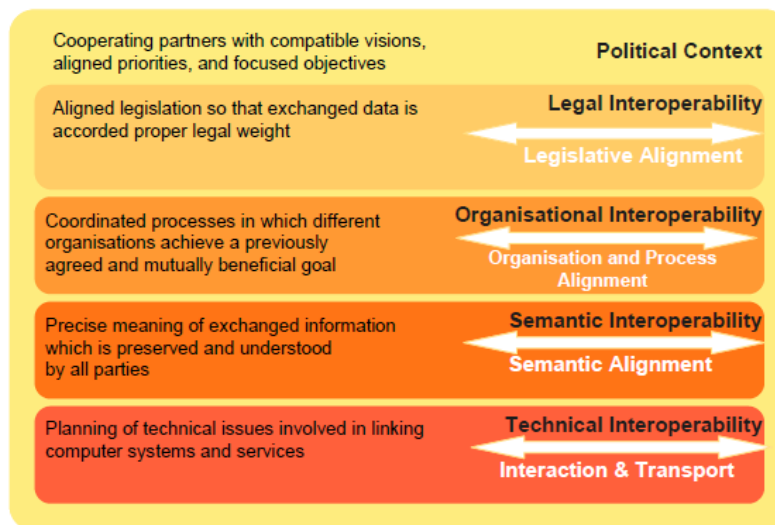
ADMS Prototype

Roadmap



European Interoperability Framework (EIF)
for
European public services

“Semantic interoperability is the ability of organizations to process information from external sources in a meaningful manner. It ensures that the precise meaning of exchanged information is understood and preserved by all parties.”



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics



To achieve semantic interoperability

Semantic Interoperability

SEMIC

Semantic Web

ADMS

ADMS Prototype

Roadmap

Find common ground: opportunities to overcome inherent differences in linguistic, cultural, legal, and administrative environments.

▶ **Better ways to discover and share interoperability assets across borders and domains:** Providing structured information about semantics of existing services and data will create the conditions for enhanced interoperability

- Enhance quality and visibility of information about semantic interoperability assets to support sharing and re-use
- Identify and analyse similarities and differences to help build bridges across services in different countries and domains



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics



Five maturity levels for metadata management

Semantic Interoperability

SEMIC

Semantic Web

ADMS

ADMS Prototype

Roadmap

Level 1 Metadata Ignorance

Reusable metadata + reference data are not documented, mainly because administrations don't consider this exercise important. This results in serious semantic IOP problems within each country as developers use ad hoc data models, metadata, codelists, taxonomies, etc for developing eGov systems.

Level 2 Scattered and/or Closed Metadata

Reusable metadata + reference data may be documented but a) not in a centralised and organized way and/or b) they are not available and accessible as "open metadata" for developers, etc

Level 3 Open Metadata for Humans

Reusable metadata + reference data are documented, and are made available as "open semantic assets" but are not systematically published in a reusable format (e.g. only available as pdf documents).

Level 4 Open Reusable Metadata

Reusable metadata + reference data are centrally documented, they are published as "open semantic assets", in a machine readable format and/or provide an API for computers to access, query and reuse them. Electronic Metadata Management Systems (MMSs) are introduced (e.g. the SEMIC platform, Digitalisér.dk) to support the established metadata architecture and policies.

Level 5 Linked Open Metadata

Semantic Assets are documented using linked data principles and are managed by advanced MMSs.



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics



SEMIC.EU: Semantic Interoperability Centre Europe

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap

SEMIC.EU is a collaborative platform and a set of services around this platform to promote semantic interoperability for eGovernment in the EU Member States

SEMIC.EU encourages public administrations to manage their code lists, taxonomies, data models as **semantic interoperability assets** and share them in its asset repository.



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics



Metadata management (2011-2012)

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap

1. Encourage Member States to **adopt** policies, processes, and repositories for *semantic asset management* at national, regional or local level;
2. Refine and **build consensus** on an interoperable way to describe the semantic asset metadata, what we like to call the [Asset Description Metadata Schema](#) (ADMS);
3. Setup a **federation of semantic asset repositories** with interested Member States that uses the above-mentioned ADMS specification as a common format for the exchange of asset description metadata.
4. Encourage Member States to **endorse and reuse** the ADMS specification.



EUROPEAN COMMISSION

DIGIT

Directorate-General for Informatics



SEMIC.EU is not the only repository on the Web

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap



Digitaliser.dk

Denmark



Xrepository.de

Germany



GOVTALK

United Kingdom

The scope of SEMIC.EU is limited to EU policies and activities.

Other countries have also started to host repositories and promote the publication of semantic interoperability assets on the Web.

It is important that these repositories are linked and interoperable. Creating interoperability across repositories creates opportunities for administrations to share across borders and domains”



EUROPEAN COMMISSION

DIGIT

Directorate-General for Informatics



Publication of asset description metadata on the Web

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap

The Semantic Web presents a huge opportunity to publish the **description metadata** of semantic interoperability assets as machine-readable data on the Web.

Common metadata vocabularies will facilitate interoperability across repositories

Tim Berners-Lee's Linked Open Data Guidelines
<http://www.w3c.org/DesignIssues/LinkedData.html>

1

Use Uniform Resource Identifiers (URIs) to uniquely identify semantic interoperability assets on the Web

2

Use HTTP URLs corresponding to these URIs so that information can be retrieved

3

Provide description metadata using open standards based on RDF(S)

4

Include links to related semantic interoperability assets, so that people can discover more



EUROPEAN COMMISSION

DIGIT

Directorate-General for Informatics



Some terminology

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap

- **Metadata:** data about data
- **Semantic interoperability asset:** a code list, taxonomy, vocabulary, data model, ontology, etc.
- **Asset description metadata:** data describing a semantic interoperability asset
- **Asset description metadata schema:** the specification (ADMS), a schema (or vocabulary) used to represent asset description metadata



EUROPEAN COMMISSION

DIGIT

Directorate-General for Informatics



Asset Description Metadata Schema (ADMS): initial draft

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap



ADMS - Asset Description Metadata Schema

Draft Specification v0.6a for Community Consultation, 2011-03-17

Authors:

Adam Arndt (National IT and Telecom Agency, Denmark)
Renke Fahl-Spiewack (Junit[AG, Berlin, Germany)
Nikos Loutas (DERI - Digital Enterprise Research Institute, NUI Galway, Ireland)
Vassilios Penistas (Interoperability Solutions for European Public Administrations (ISA), Directorate-General for Informatics, European Commission)
Sebastian Sklarß (Junit[AG, Berlin, Germany)
Sofia Zapounidou (University of Macedonia, Greece)

Copyright © 2011 SEMIC.EU. All Rights Reserved.

[back to top](#)

Abstract

The Asset Description Metadata Schema (ADMS) tackles the issue of a federation of repositories for semantic assets to make decentralised resources available through a single point of access. ADMS can be used as a common language to describe semantic artefacts stored in separate systems. It can also provide some directions for new initiatives to create similar repositories. In this way, ADMS will facilitate the federated use of semantic resources, especially of those used for and by public administrations.

Table of Contents

- 1 [Introduction](#)
- 2 [Scope and Definitions](#)
 - 2.1 [Scope and intended usage](#)
 - 2.2 [ADMS Architecture](#)
 - 2.3 [Definitions](#)
- 3 [ADMS - Roadmap](#)
- 4 [ADMS - Design principles](#)
 - 4.1 [ADMS development: Keep it as simple as possible](#)
 - 4.2 [Guidelines of ADMS development](#)
 - 4.3 [ADMS - Use cases](#)
- 5 [ADMS - Asset Description Metadata Schema](#)
 - 5.1 [ADMS Overview](#)
 - 5.2 [ADMS Core Elements](#)
 - 5.3 [ADMS Extension Elements](#)
- 6 [Acknowledgements](#)

! Version 0.6a !
Initial draft to be
further elaborated
and endorsed by the
EU Member States

The Asset Description Metadata Schema (ADMS) will be a common vocabulary to publish description metadata about code lists, taxonomies, data models, etc. on the Web



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics



Asset Description Metadata Schema (ADMS): initial draft

Semantic Interoperability

SEMIC.EU

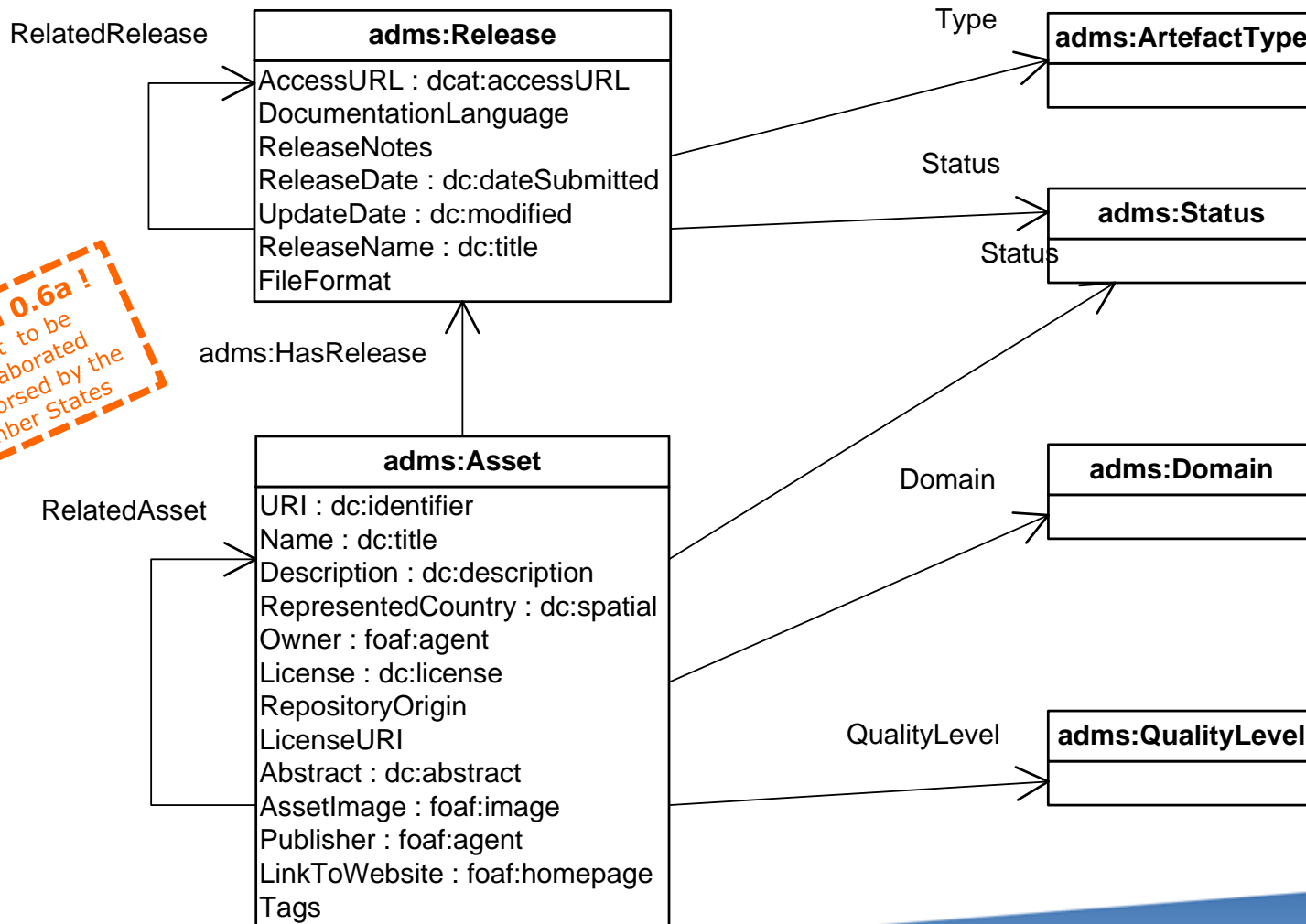
Semantic Web

ADMS

ADMS Prototype

Roadmap

! Version 0.6a !
Initial draft to be
further elaborated
and endorsed by the
EU Member States



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics



The ADMS will enable the following benefits

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap

- Publication of interoperability asset description metadata in a machine-readable format.
- Create links between semantic interoperability assets on the Web.
- Exchange of asset description metadata with other repositories.
- Allow users to more easily search and retrieve information about semantic interoperability assets and discover related assets.
- Contributes to the semantic interoperability of electronic public services, leading to the benefit of citizens and businesses



EUROPEAN COMMISSION

DIGIT

Directorate-General for Informatics



A prototype federates asset metadata from three repositories

Semantic Interoperability

SEMIC.EU

Semantic Web

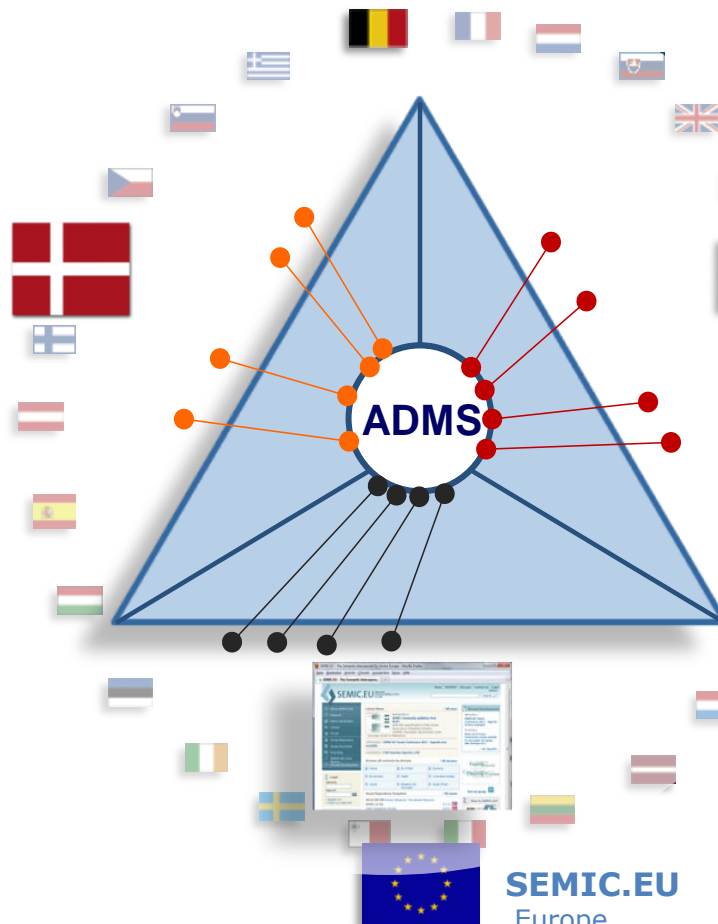
ADMS

ADMS Prototype

Roadmap



Digitalisér.dk
Denmark



Xrepository.de
Germany



SEMIC.EU
Europe



EUROPEAN COMMISSION

DIGIT

Directorate-General for Informatics



The federated repository is accessible through a central portal

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap



Federated Portal

Of Repositories on Semantic Interoperability Solutions

This prototype shows the federation of 3 different repositories (Danish Digitaliser, German XRepository and European SEMIC) via a common metadata schema called "ADMS".

Browse Assets

Identifier

Title

Issued



Keyword

Country

Domain

Search



<http://vmudi205.deri.ie/elda/index.html>



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics



Roadmap

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap

Design process and methodology

September 2011 ✓

ADMS Working Group formed

October 2011 ✓

Consensus building on ADMS

March 2012

ADMS v1

April 2012

Improved search on Joinup
based on ADMS

April 2012

Federation of semantic asset
repositories

May 2012



EUROPEAN COMMISSION

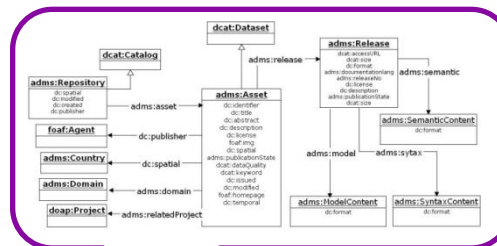
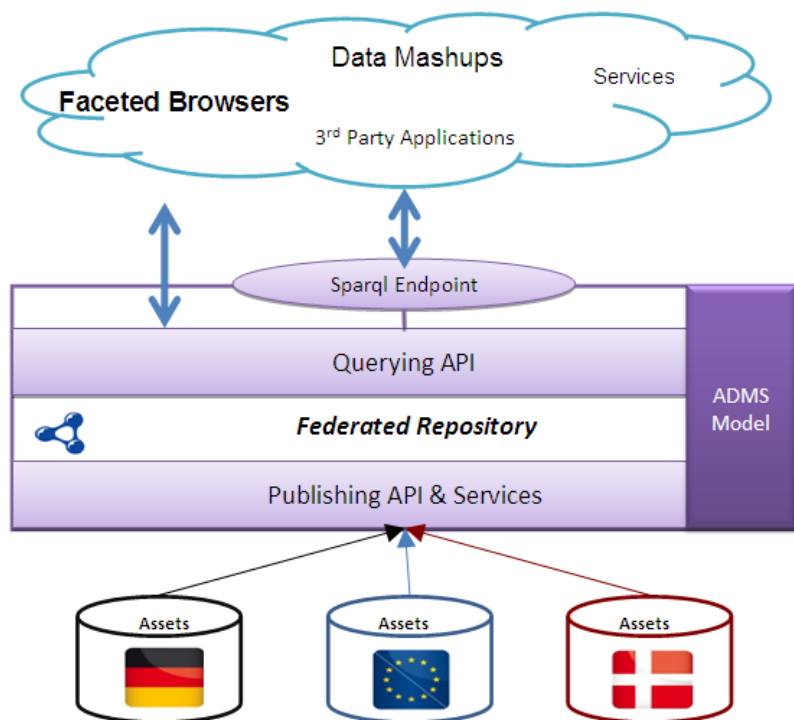
DIGIT

Directorate-General for Informatics



Work Ahead

Asset Description Metadata Schema (ADMS)



- ☑ Enabling a **federation** of semantic assets repositories;
- ☑ Using **common semantics** to describe a “semantic asset”
- ☑ Need a **common schema** for assets description or an **Asset Description Metadata Schema (ADMS)**





The specification of the ADMS is open to all stakeholders

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap

1. **Advanced draft:** the **ADMS Work Group** works on an advanced draft, supported by representatives from EU Member States and external experts.
2. **Publication:** The work on the ADMS will be reflected on the joinup.eu collaborative platform.
3. **Review:** The advanced draft is open to review by all representatives from EU Member States and external stakeholders.
4. **Proof-of concept:** As proof-of-concept a federation prototype will be built federating existing repositories using ADMS as exchange format.
5. **Endorsement:** After the review period, the ADMS is presented for **endorsement** to the EU Member States who participate in the ISA programme.



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics



Conclusion

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap

- eGovernment code lists, taxonomies, ontologies, etc. should be managed as *assets* of semantic interoperability and MS should become aware of the importance of their metadata.
- ADMS is a vocabulary to represent description metadata about semantic interoperability assets.
- Development supported by the European Commission, open to all stakeholders.
- A first prototype has been built.
- An architecture will be developed to allow for federated search.



EUROPEAN COMMISSION

DIGIT

Directorate-General for Informatics



Questions? Thank you for your feedback!

Semantic Interoperability

SEMIC.EU

Semantic Web

ADMS

ADMS Prototype

Roadmap



EUROPEAN COMMISSION

DIGIT
Directorate-General for Informatics