Building Semantic Interoperability in Europe

Federation of Semantic Asset Repositories

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Agenda

Promoting Open Government Metadata

The need for ADMS

ADMS in practice

Get involved

European Commission

ISA is undertaking a number of initiatives around Interoperability

isa
Interoperability Solutions for European Public Administrations

What is interoperability?
Ability of disparate organisations to interact towards mutually beneficial and agreed goals, involving the sharing of information and knowledge

What is semantic interoperability?

Political context

Cooperating partners with compatible visions, aligned priorities, and focused objectives

Legal interoperability	• Aligned legislation so that exchanged data is accorded proper legal weight
Organisational Interoperability	• Coordinated processes in which different organisations achieve a previously agreed and mutually beneficial goal
Semantic Interoperability	• Precise meaning of exchanged information which is preserved and understood by all parties
Technical Interoperability	• Planning of technical issues involved in linking computer systems and services

A semantic asset is

- highly reusable metadata
  (e.g. xml schemata, generic data models)

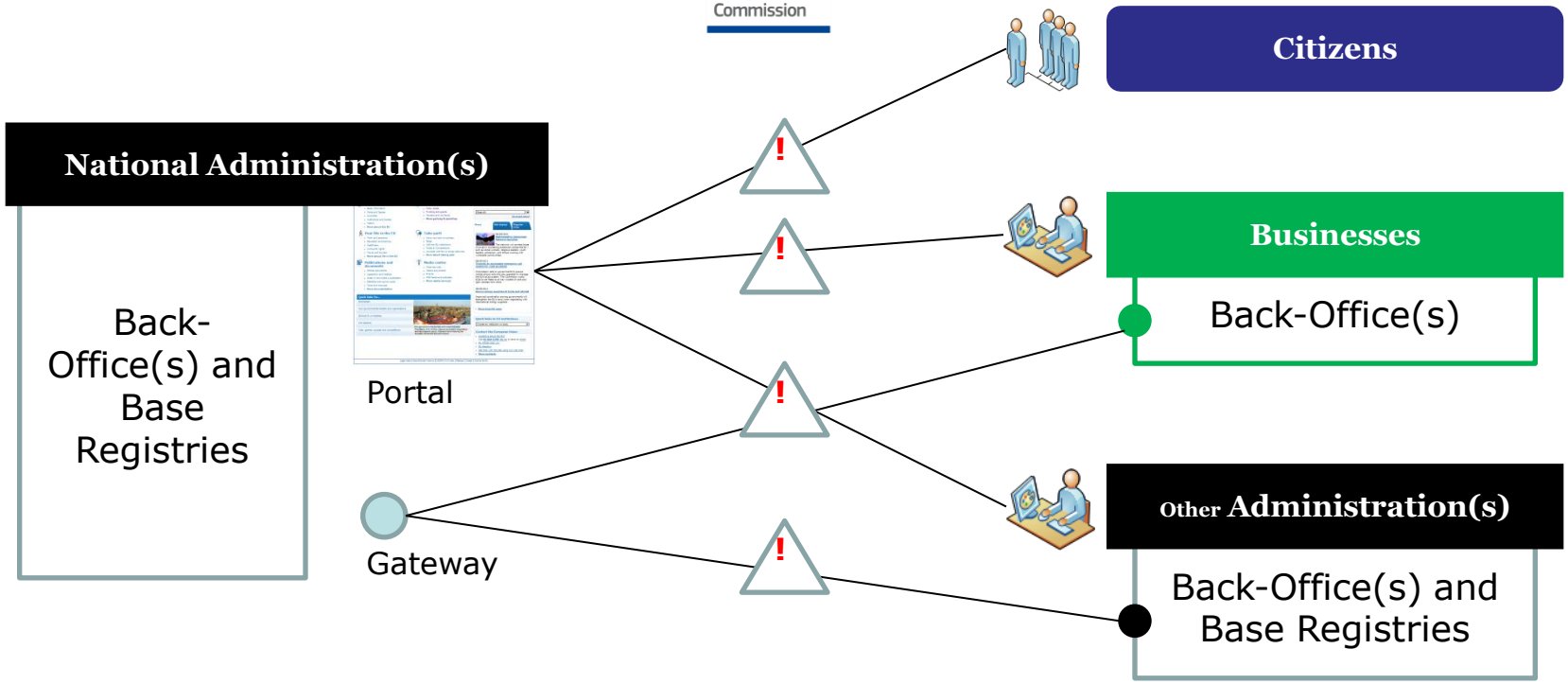
- & reference data
  (e.g. code lists, taxonomies, dictionaries, vocabularies)

Semantic agreement(s)

- Organisations use semantic assets to share information and knowledge (within themselves and with others)

- Interoperable interfaces depend on semantic assets

Why are semantic assets important?



Different metadata and reference data cause **semantic conflicts**

This is caused by unnecessary redundancy, variants, lack of awareness and management of semantic assets

European Commission

What is semantic asset management?

- adopting policies, processes, and tools (repositories)
- to plan, evaluate, and improve the use and reuse of semantic assets to share information and knowledge

This means that semantic assets should be:

- properly documented and stored in a repository (shared drive, wiki, content management system, etc)
- easily discoverable and retrievable,
- accessible in a reusable format (open license)

Why are semantic assets important?

GCloud in the UK

*Departments **must reuse and share ICT solutions**, rather than purchasing new or bespoke solutions. The mandation of specific open standards will make ICT solutions fully interoperable to allow for reuse, sharing and scalability across organisational boundaries*

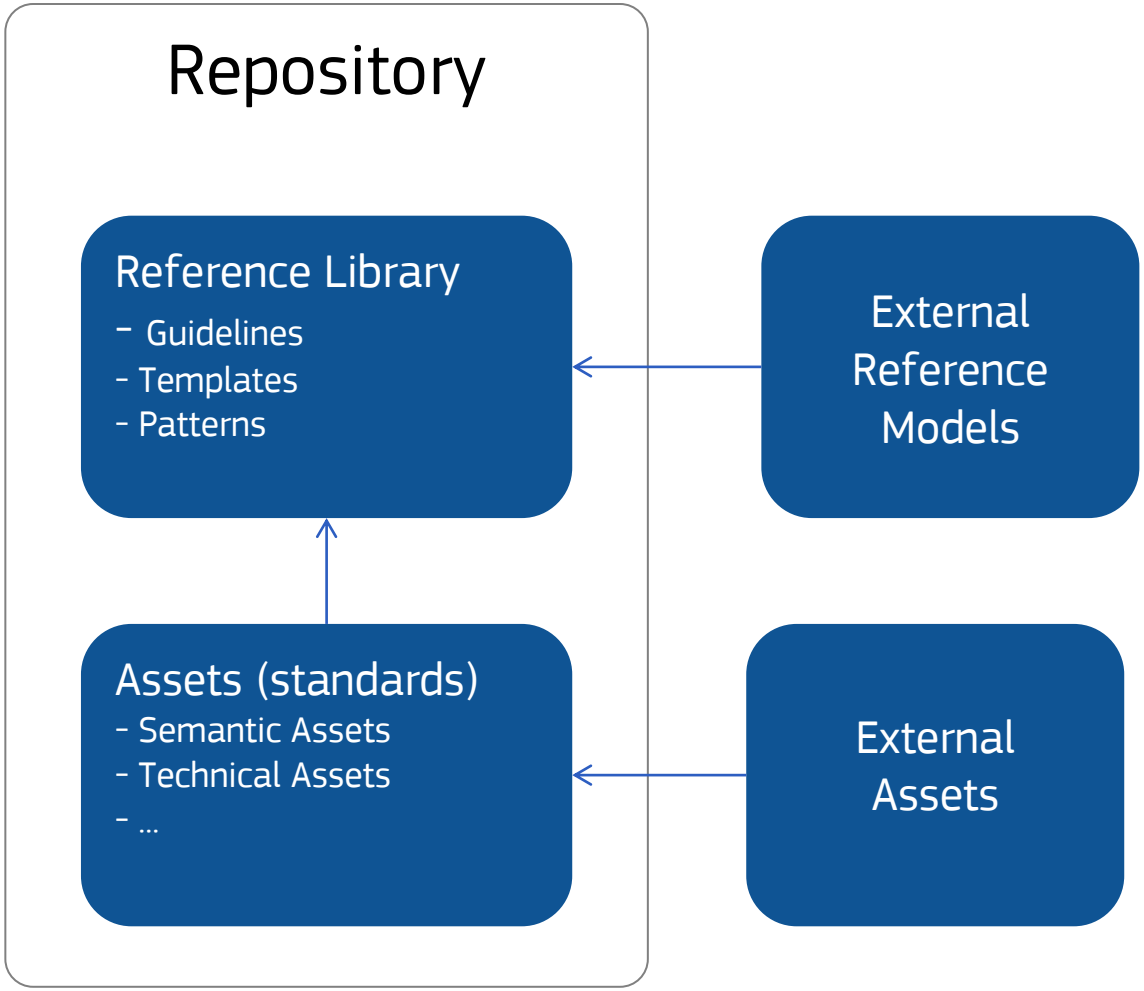
SharedFirst in the US

***Shared First" foundational paradigm** which provides Federal agencies with guidance on the identification, implementation, and operation of shared services for commodity, support, and mission IT functions.*

What is a repository?

Implemented as:

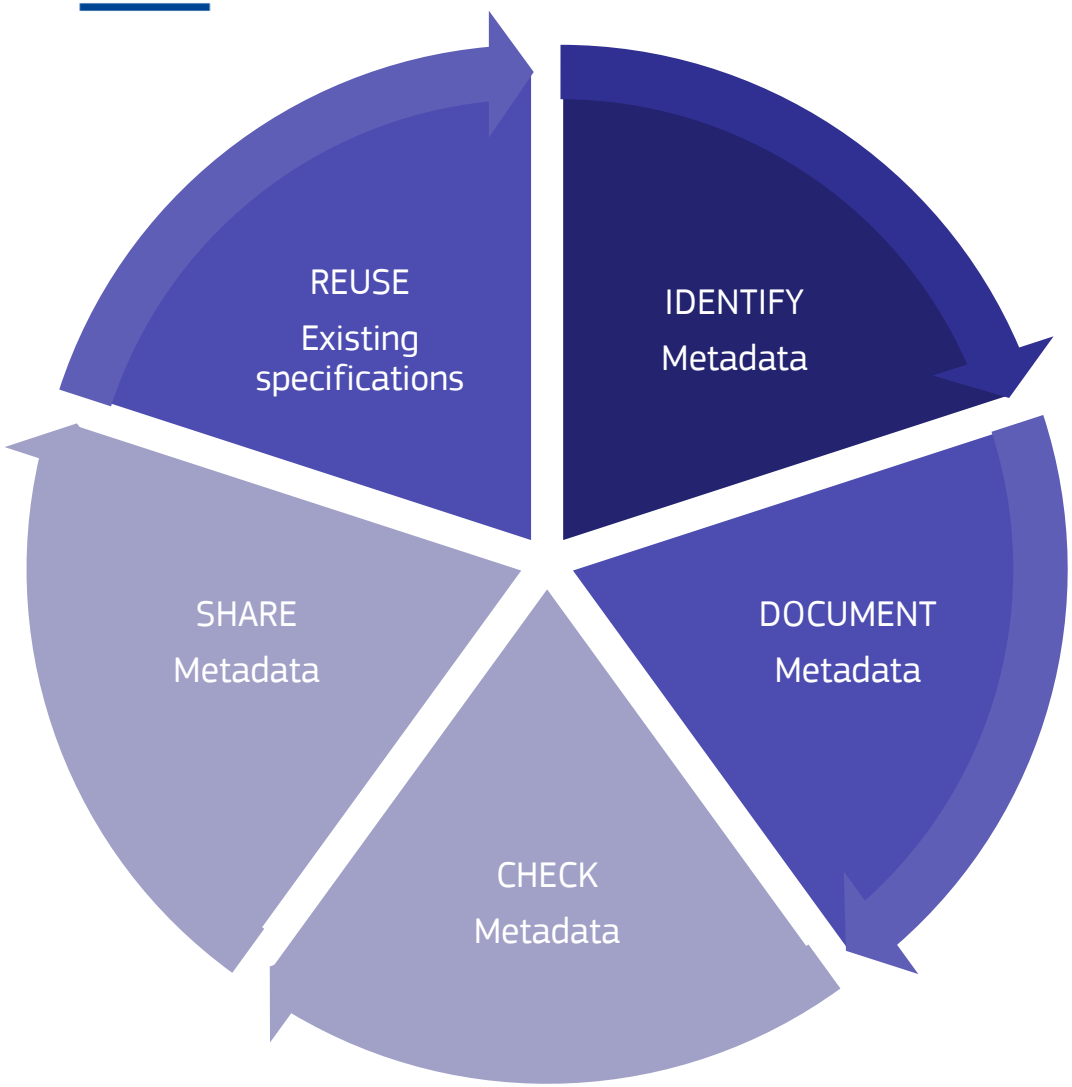
- Content Management System (CMS)
- Wiki
- Webpage / web-application



Reuse virtuous cycle

Metadata Management includes the following actions:

- Public administrations should identify important *Metadata* with reuse potential for developing eGovernment applications and systems.
- Public administrations should systematically document this *Metadata*.
- Public administrations should check their *Metadata* to identify inconsistencies, overlaps, conflicts and opportunities of harmonization.
- Public administrations should make their *Metadata* open for reuse.



Main benefits

- ✓ Cost savings
- ✓ Coherent Architecture
- ✓ Interoperability

Semantic Assets Management Maturity Model

★ **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, code lists, taxonomies, etc for developing eGov systems.

★★ **Scattered and/or Closed semantic assets**

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

★★★ **Open 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).

★★★★ **Open and machine readable**

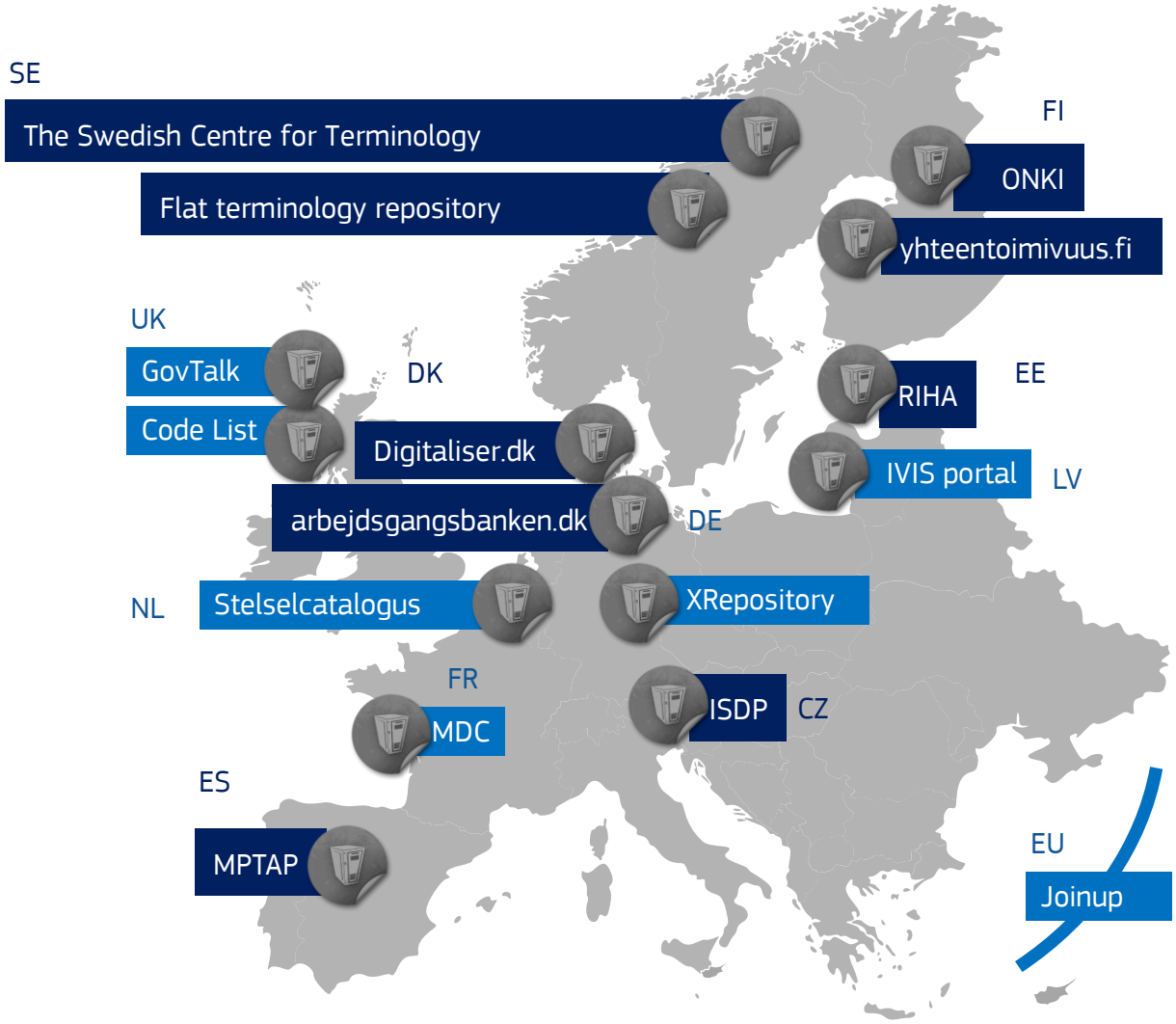
Reusable metadata + reference data are centrally documented, they are published as "open semantic assets", in a machine readable format and/or provide an API for computers to access, query and reuse them. Electronic Metadata Management Systems (MMSs) are introduced (e.g. the SEMIC platform, Digitalisér.dk)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

★★★★★ **Linked open semantic assets**

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

There are several semantic asset repositories in Europe

There is a growing number of repositories storing, indexing and making available semantic assets.



LEGEND

Respondents to the survey

Non-respondents to the survey

Survey: Metadata Maturity Level

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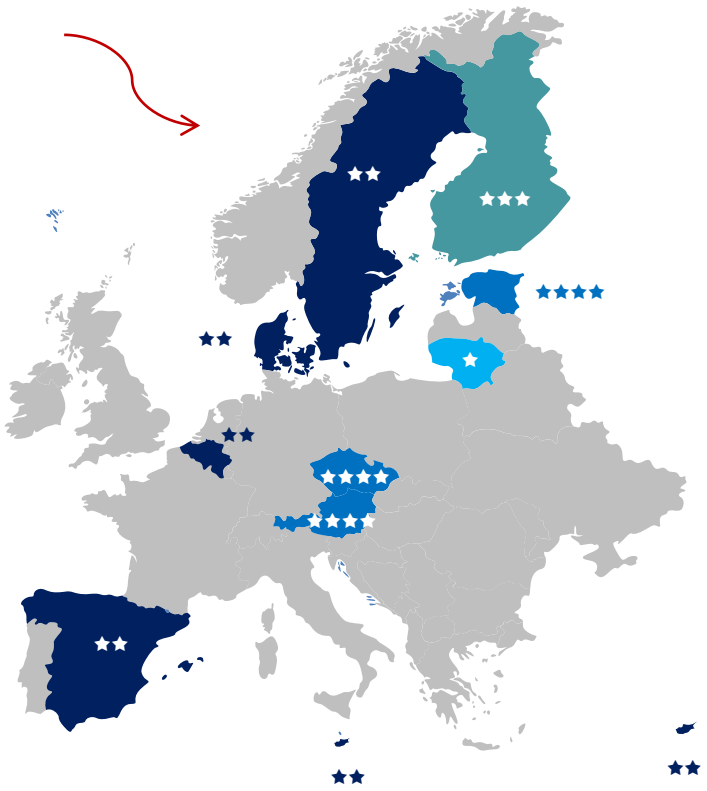
Problem ?



Among the 11MSs that have participated in this survey:

1 ★ Metadata Ignorance

6 ★★ Scattered and/or Closed Metadata

1 ★★★ Open Metadata for Humans

3 ★★★★ Open Reusable Metadata

Problem ?

Overall, it seems that Europe is still at the

dawn of metadata management but

several Member States are already working to close the gap between their current modest level and the one required for them to be effective and efficient in managing this type of assets.

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European Commission

Reuse by Sanction vs. **Reuse by Buy In**

Reduce reuse burden

Make it simple to find, understand and reuse semantic assets

European Commission

Each organisation works on standards but does not use a standard description to describe their standards.

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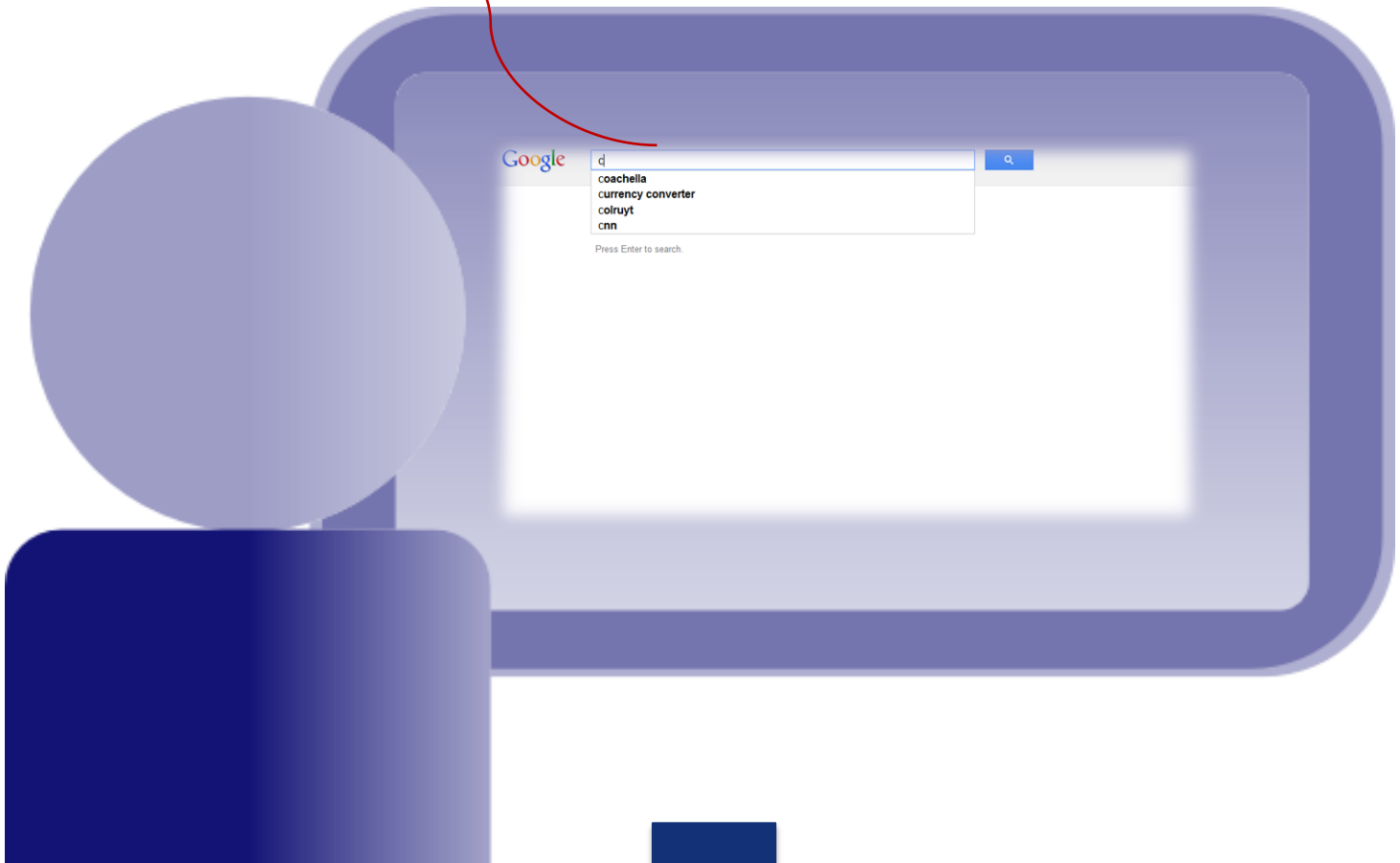
I am looking for a particular standard



European Commission

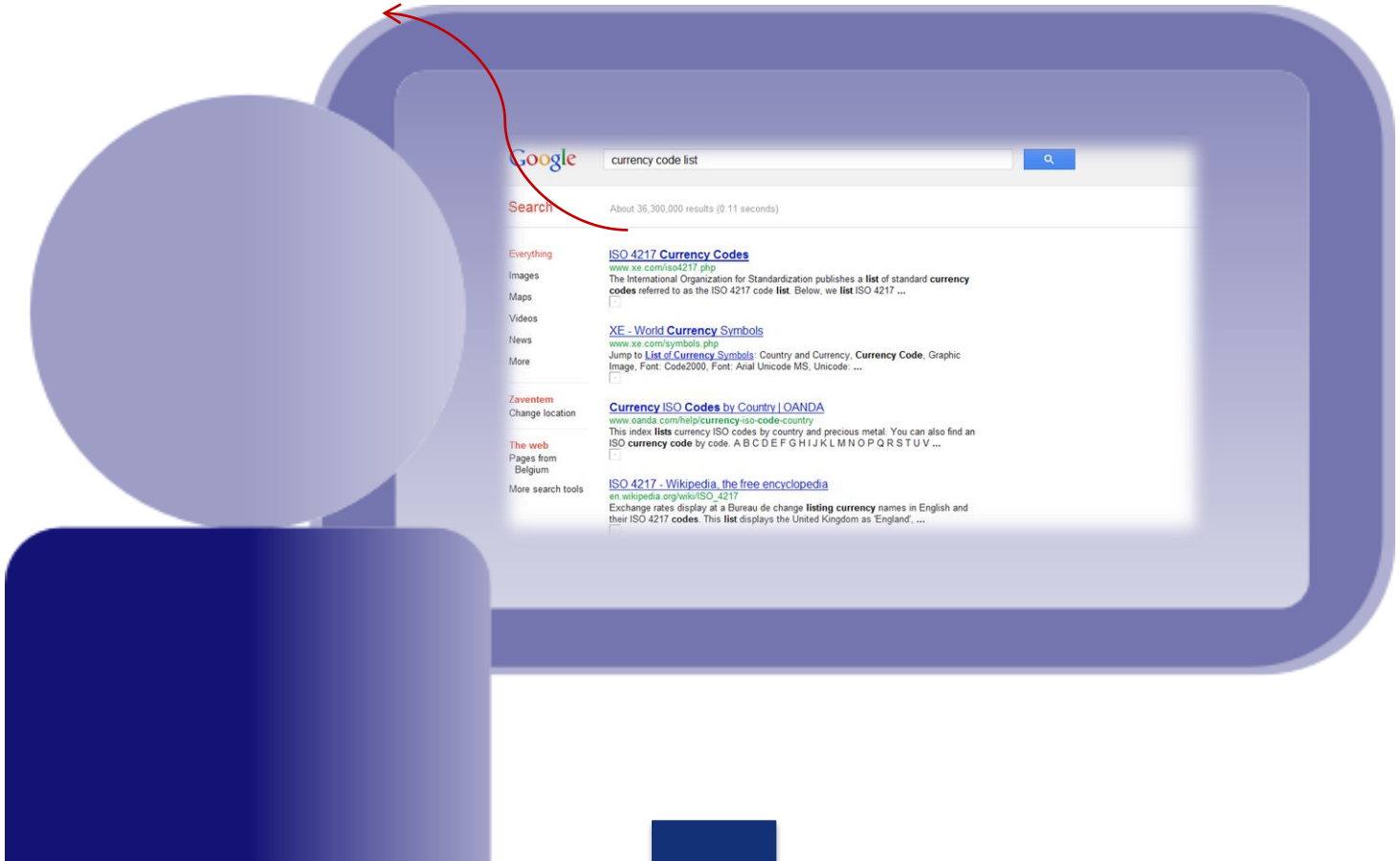
Google is not good enough

There are too many websites

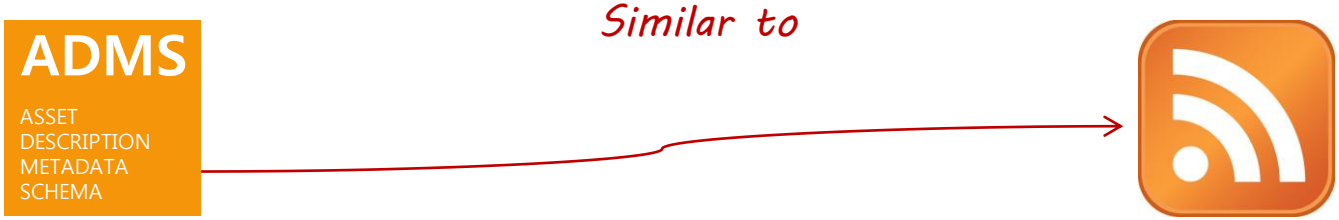
I don't know what to use

Is it the right version?

Is it machine-readable?



What is ADMS?



Asset Description Metadata Schema (ADMS)

Standard vocabulary to describe semantic assets.

Really Simple Syndication (RSS)

Standard vocabulary to describe a web resource.

Our approach

Distributed approach

International Commission on Civil Status

UN/CEFACT

ETSI

Digitaliser.dk (Denmark)

RIHA (Estonia)

OASIS

GS1

W3C

XRepository (Germany)

The Open Group

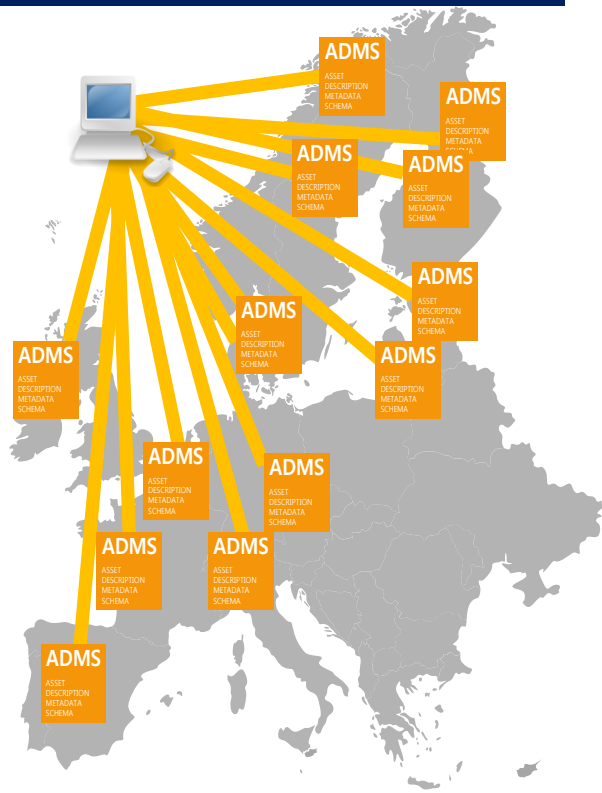
EU Publications Office

Listpoint

ADMS
ASSET DESCRIPTION METADATA SCHEMA

Aggregators

Get ADMS file
Parse ADMS file



Standard vocabulary to describe semantic assets
enabling others to find them but keeping the asset in the repository of its publisher

Typical Use Case

European Commission

1 Analyse your semantic assets

CMS

Assets

Wiki

Assets

Web page

Assets

Web

ADMS
ASSET DESCRIPTION METADATA SCHEMA

ADMS
ASSET DESCRIPTION METADATA SCHEMA

ADMS
ASSET DESCRIPTION METADATA SCHEMA

2 You describe your assets following ADMS specification

3 Assets can be searched and retrieved

Virtual aggregator

URLs

ADMS
ASSET DESCRIPTION METADATA SCHEMA

ADMS
ASSET DESCRIPTION METADATA SCHEMA

ADMS
ASSET DESCRIPTION METADATA SCHEMA

How to implement ADMS ?

European Commission

1 MAP
ADMS

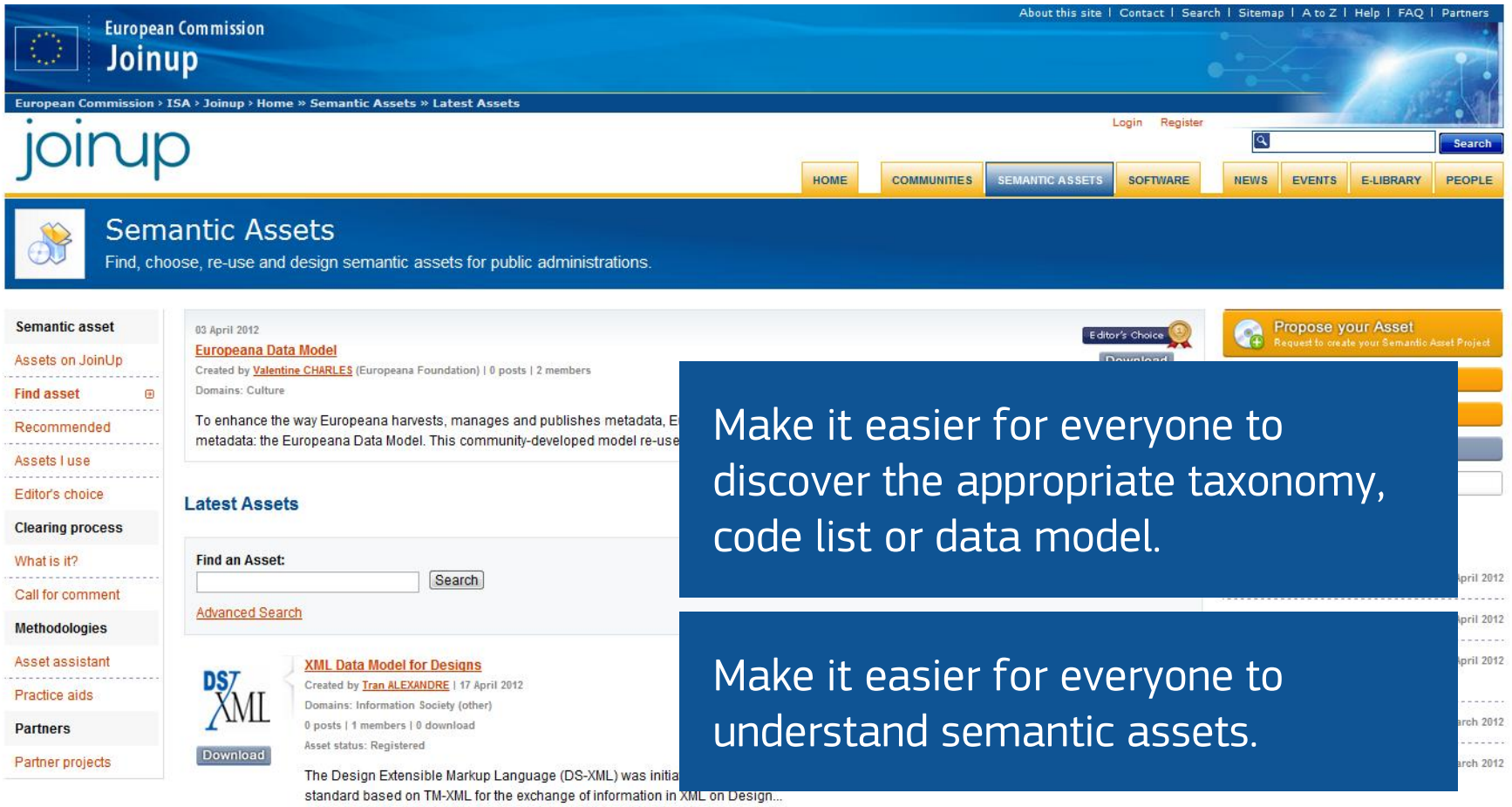
2 CREATE
ADMS file

3 TRANSMIT
ADMS file

Number of assets in the repository

MAP	CREATE	TRANSMIT
Build a mapping from a native schema to ADMS	Use a dedicated exporter that transforms the current representation of the semantic assets into ADMS	Send the ADMS description (RDF/XML format) to Joinup via REST Web Services
Use ADMS as a native metadata description schema	Use the webpage on Joinup: web form to encode the ADMS file directly on Joinup	Send the ADMS description (spreadsheet or RDF/XML format) to Joinup via e-mail
Annotate assets manually with ADMS and publish them on the web	Create manually the file using a text editor or a form.	Publish the ADMS Joinup via e-mail description on the Web (RDF/XML format), so Joinup can harvest it
Use the ADMS editor to annotate assets manually on Joinup	Use the ADMS editor on Joinup: web form to encode the ADMS file directly on Joinup	Upload manually the ADMS description (spreadsheet or RDF/XML format) on Joinup

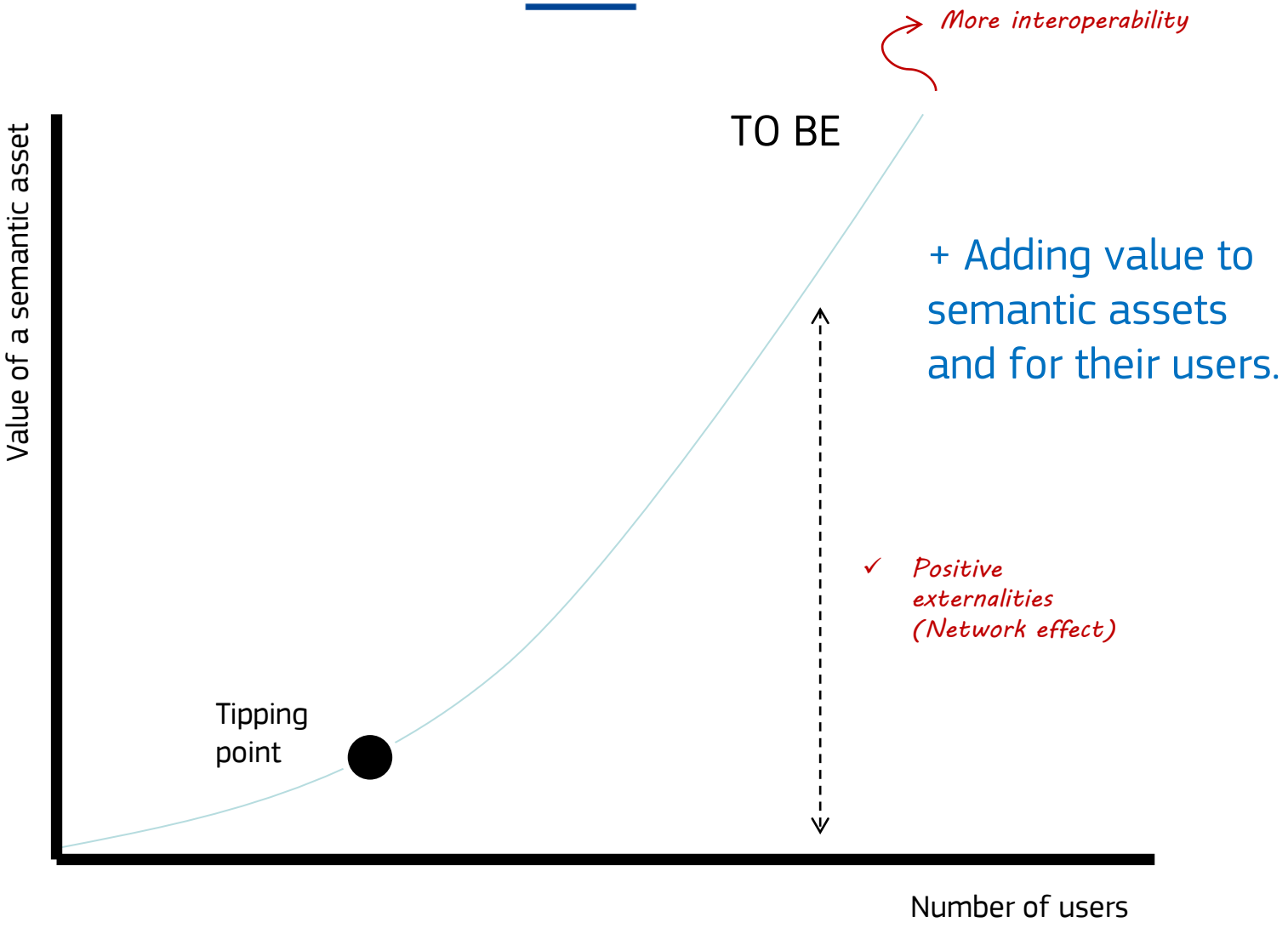
The Commission is creating its own virtual aggregator



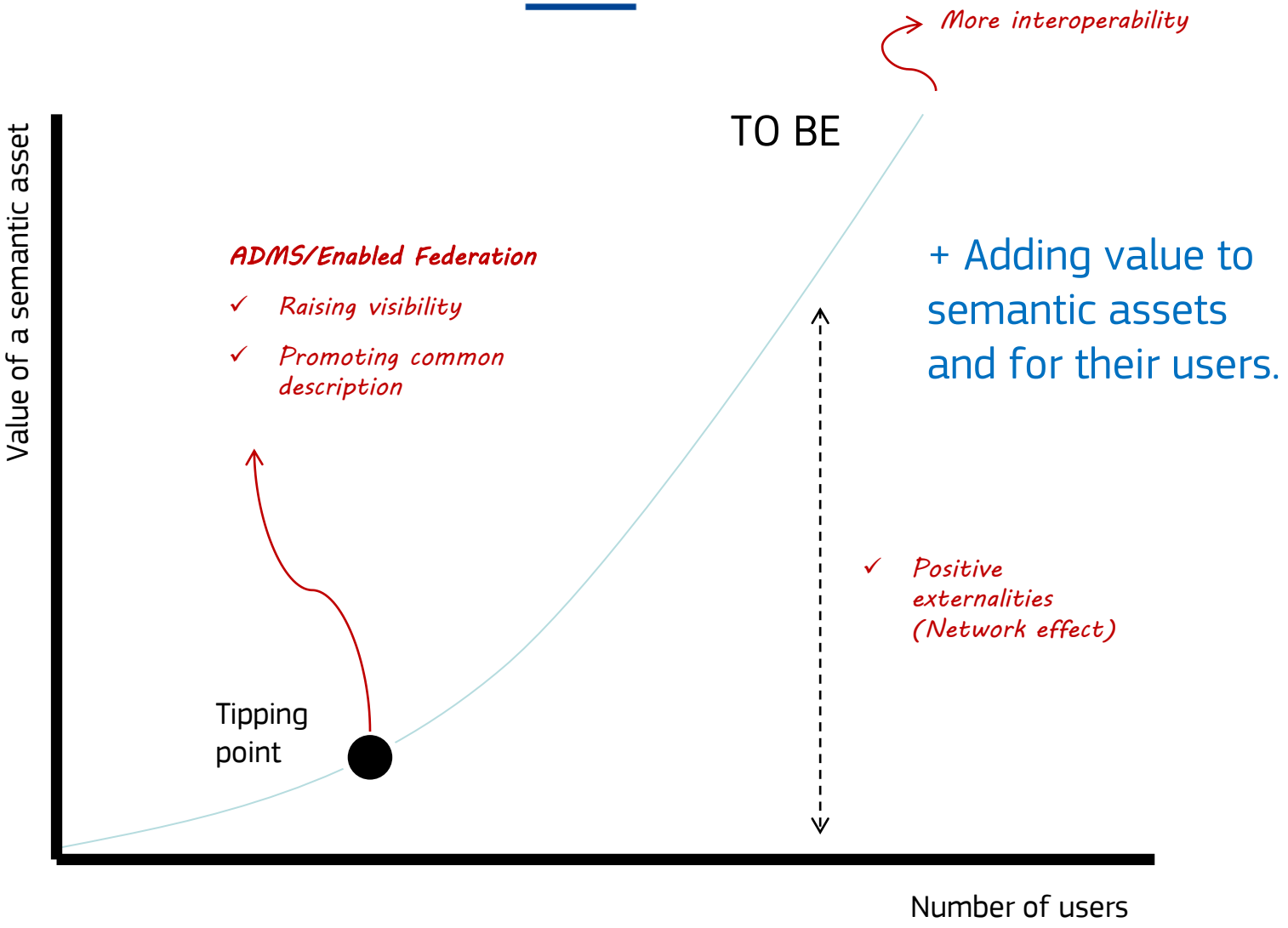
Make it easier for everyone to discover the appropriate taxonomy, code list or data model.

Make it easier for everyone to understand semantic assets.

What is the value of ADMS?



What is the value of ADMS?



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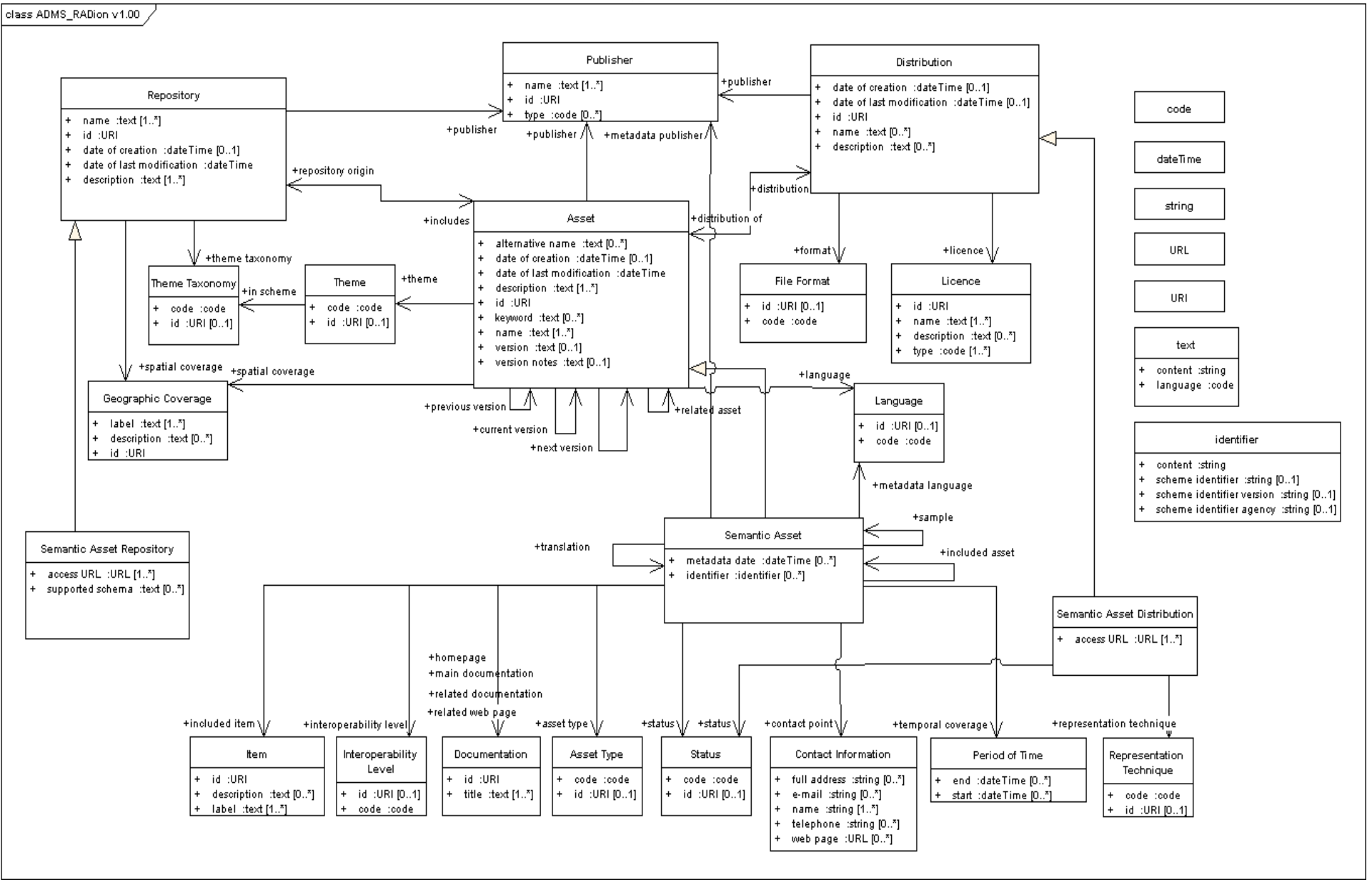
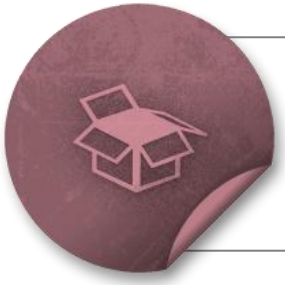
ADMS specification



ADMS specification

European Commission

Primary concepts



Repository

Asset

Data dictionaries, data models, code lists, XML schemas and RDF models

Distribution

Web URL

Supporting concepts

- Asset Type
- Contact Information
- Documentation
- File Format
- Geographical Coverage
- Item
- Interoperability Level
- Language
- Licence
- Period of time
- Publisher
- Representation Technique
- Status
- Theme
- Theme Taxonomy

ADMS representation

RDF Schema

- Provided separately and serialised in RDF/XML-with an XSLT-that renders it into an HTML page for human readers.
- The majority of terms used to express ADMS in RDF are taken from existing vocabularies, notably Dublin Core-and FOAF.
- The primary classes for ADMS (Semantic Repository, Semantic Asset and Semantic Asset Distribution) are all sub classes of the relevant classes in RADion.
- Terms defined in RADion are not repeated in the RDF schema for ADMS.
- Domain and range restrictions have not been defined for terms borrowed from existing vocabularies and have only been defined sparingly for ADMS's own terms.

XML Schema

- The backbone of ADMS in XML is a Common Library of information elements provided by the library of the Universal Business Language (UBL).
- The philosophy behind this design is to achieve reusability of information elements defined by the Core Component Technical Specification (CCTS) of UN/CEFACT (the basis of UBL).

European Commission

Multi disciplinary
working group

43 people

20 Member States and the US.

\+ EU institutions

Standardization bodies

External experts/academia

PwC and W3C facilitation +
W3C methodology

Enthusiasm around ADMS

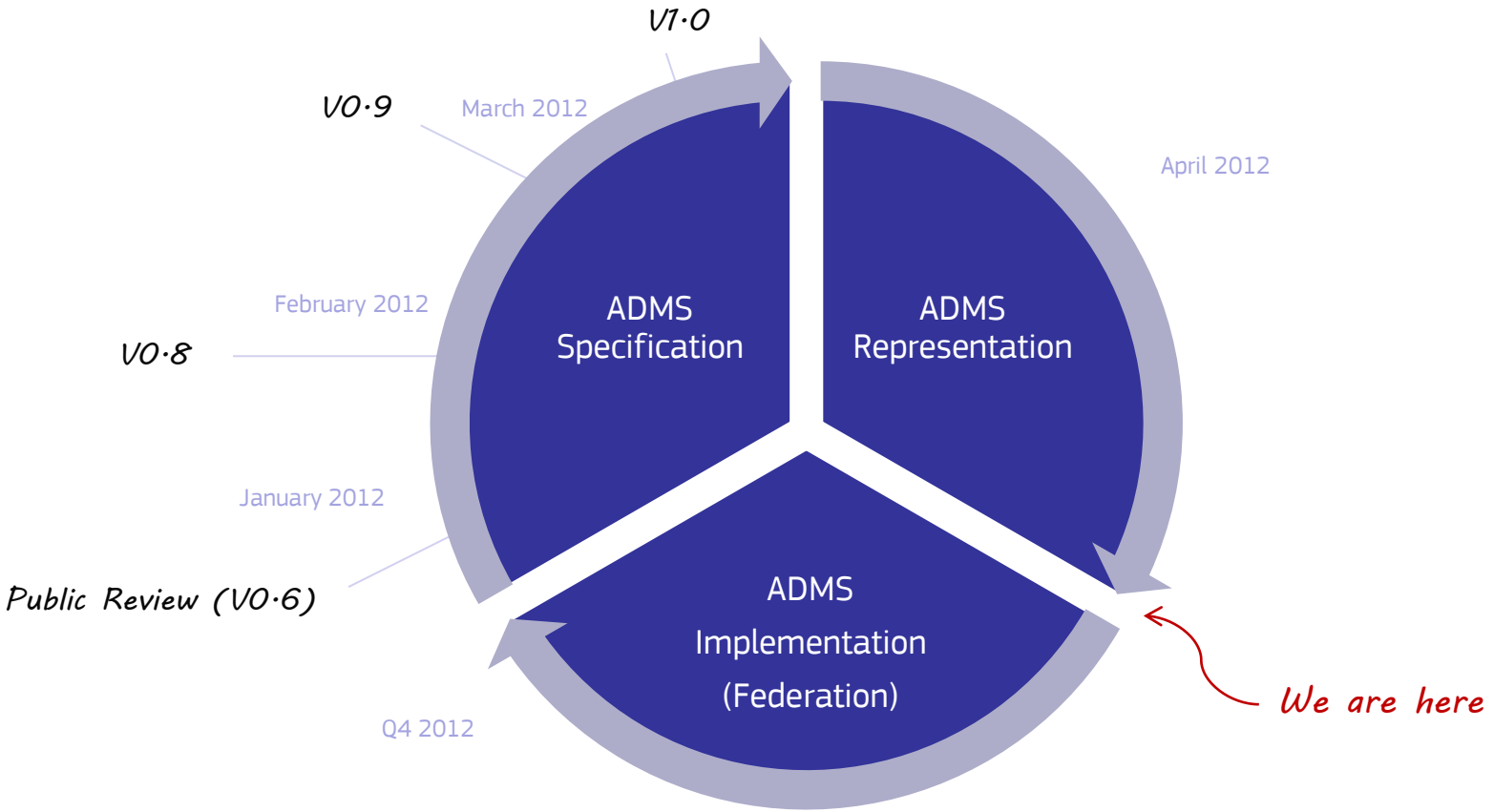
The ADMS specification:

1200 reads

640 downloads

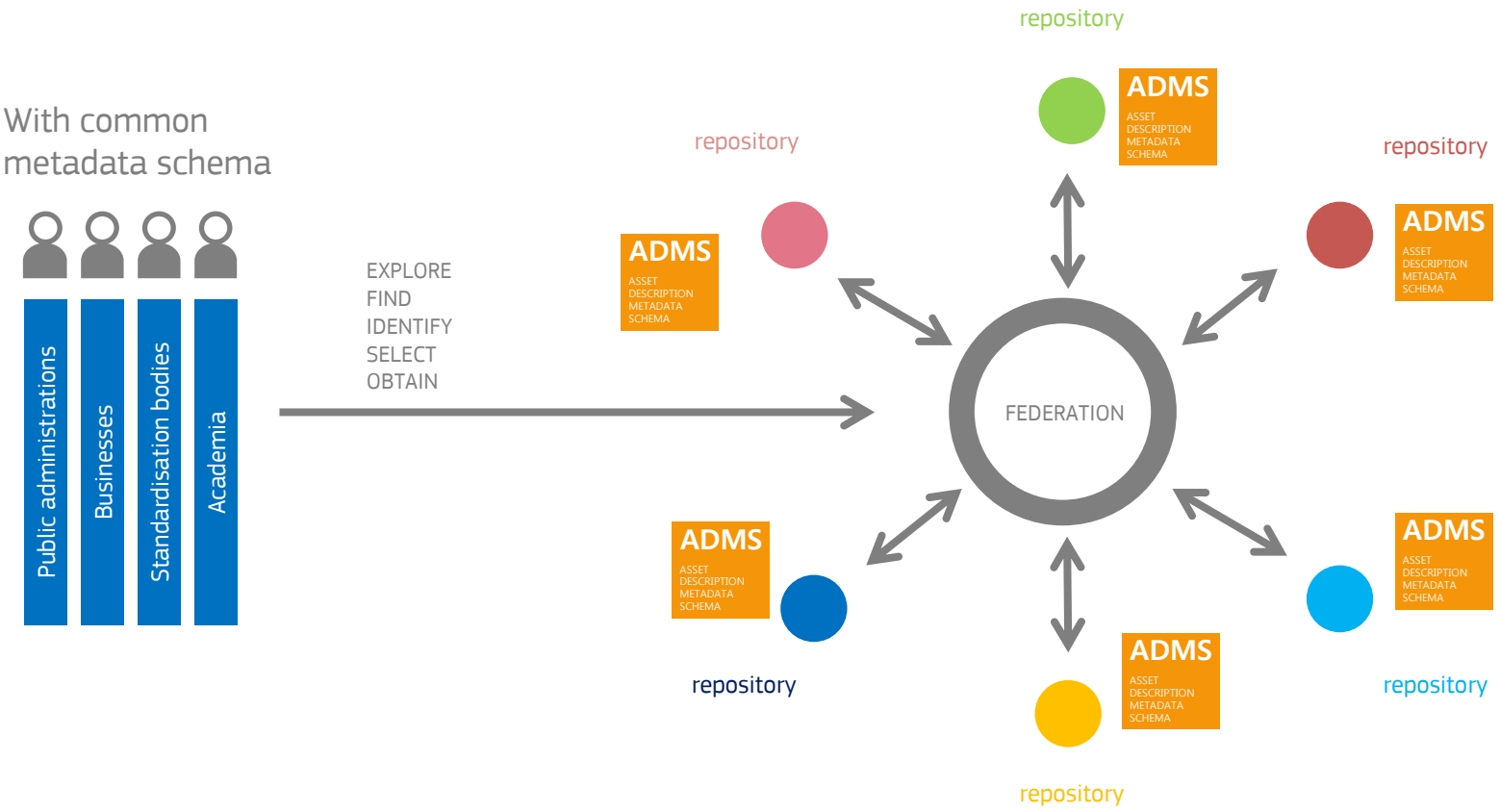
Currently the specification is available in
UML, XML, RDF
formats for public review

ADMS Lifecycle



Who is already involved?

ADMS-enabled federation



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Mission

Provide standards and other information which help governments around the world publish their data as effective and usable Linked Data using Semantic Web technologies

How to join the WG?

http://www.w3.org/2011/gld/wiki/How_To_Join

Objectives

- Develop W3C Recommendations to guide governments publishing data in which RDF vocabulary terms to use in information about certain common concept areas.
- Gather and publish use cases and requirements for vocabularies to cover each of the following areas:

Metadata

Suitable for provenance, data, data quality, timeliness of data, status, refresh rate, etc.

Statistical "Cube" Data

The group will produce a vocabulary, compatible with SDMX, for expressing some kinds of statistical data.

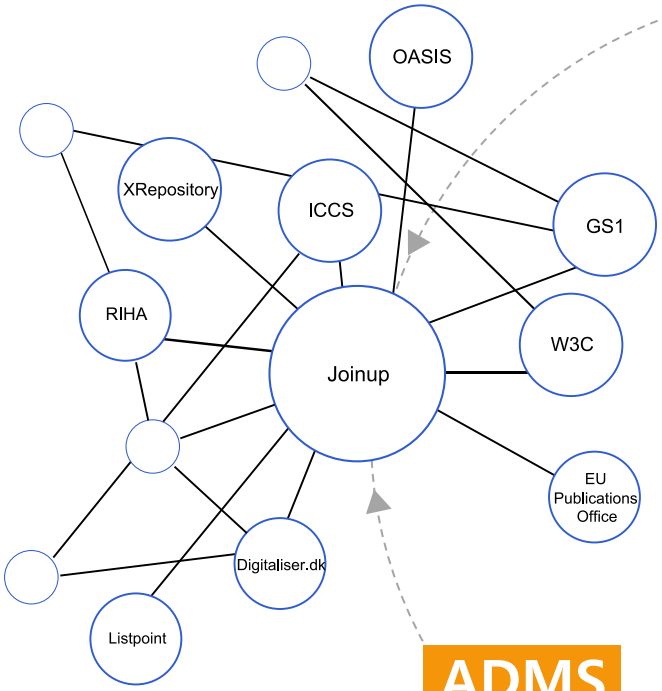
People

Such as elements of FOAF or vCard in RDF. This is an area for particular attention to privacy considerations.

Organizational Structures.

Such as the Epimorphics the organization ontology

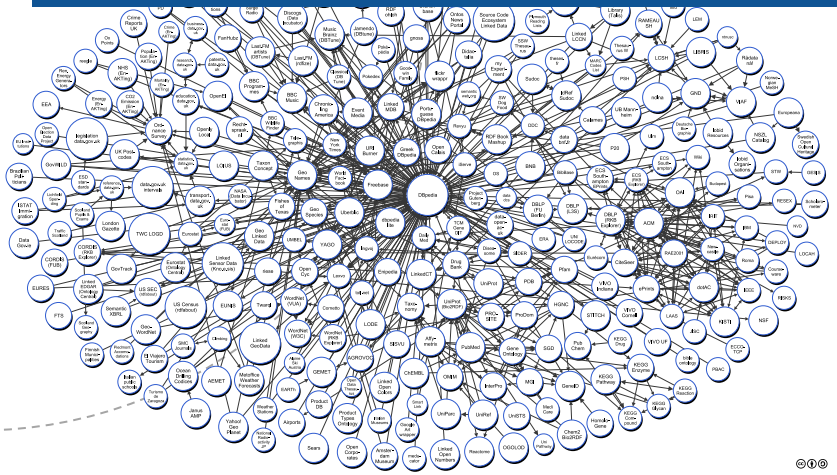
Get involved



ADMS

ASSET
DESCRIPTION
METADATA
SCHEMA

Join the ADMS-enabled federation and connect your semantic assets on the Linked Data Cloud.



Linking Open Data cloud diagram, by Richard Cyganiak and Anja Jentzsch. http://lod-cloud.net/

European Commission

Download

Federation Brochure

http://joinup.ec.europa.eu/elibrary/document/adms-enabled-federation-semantic-asset-repositories-brochure

ADMS Brochure

https://joinup.ec.europa.eu/elibrary/document/adms-brochure

Contact

Programme Manager

Vassilios.PERISTERAS@ec.europa.eu

Team

https://joinup.ec.europa.eu/contact

European Commission

Join ISA Initiatives on Joinup

http://goo.gl/sLHlU	http://goo.gl/3VCZU	http://goo.gl/tY9ty	http://goo.gl/q2RQx	http://goo.gl/VODFF	http://goo.gl/dqOnm	http://goo.gl/03xkP
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 F/OSS

http://goo.gl/eK1EY @SEMICeu http://joinup.ec.europa.eu

http://semic2012.eventbrite.com/

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

“It is the unexpected re-use of information which is the value added by the web”

Tim Berners-Lee