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D3.1 – Extended ADMS specification

ADMS Application Profile for Joinup

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1 INTRODUCTION

1.1 Context

This document is prepared in the context of Action 4.2.4¹ of the Interoperability solutions for European public administrations (ISA) programme of the European Commission (EC). This programme funds initiatives to foster the efficient and effective cross-border electronic interactions between European public administrations.

Action 4.2.4 is targeted towards the creation of a European Federated Interoperability Repository (EFIR). In 2011, the ISA Programme created the Asset Description Metadata Schema (ADMS)². ADMS is a common vocabulary to describe *interoperability assets*, making it possible for ICT developers to discover and reuse interoperability assets through the federation of asset repositories³ on Joinup.

ADMS was originally produced by the ADMS Working Group following the Process and Methodology for Developing Core Vocabularies⁴ under the European Commission's ISA Programme. It was reviewed by representatives of the Member States of the European Union, publishers of Public Sector Information (PSI), and by other interested parties. ADMS was published as a Working Group Note⁵ by the Government Linked Data Working Group⁶ of the World Wide Web Consortium (W3C). The ADMS namespace document⁷ is published by W3C, generated from the associated Resource Description Framework (RDF) schema.

The objective of this action is to broaden Action 1.1⁸ (on improving semantic interoperability) by extending the ADMS-enabled federation to other types of interoperability solutions, meaning solutions covering the political, legal, organisational and technical interoperability layers defined by the European Interoperability Framework (EIF)⁹.

1.2 Objectives and Scope

The objective of this document is to define an **Application Profile of ADMS for Joinup**. An Application Profile is a specification that re-uses terms from one or more base standards, adding more specificity by identifying elements to be used for a particular application, as well as recommendations for controlled vocabularies to be used.

The ADMS specification was originally drafted to describe semantic interoperability assets. This application profile of ADMS aims to extend the use of ADMS for the description of other types of interoperability solutions. The changes include the following:

1. **extension of ADMS taxonomies and controlled lists** to cover all interoperability layers defined by the EIF and align the terms with the concepts from the EIA building blocks (defined under Action 2.1 - European Interoperability Architecture (EIA)¹⁰;

¹ http://ec.europa.eu/isa/actions/04-accompanying-measures/4-2-4action_en.htm

² European Commission. Joinup. Asset Description Metadata Schema (ADMS), version 1.00. 18 April 2012. <https://joinup.ec.europa.eu/asset/adms/release/100>

³ <https://joinup.ec.europa.eu/elibrary/video/towards-open-metadata-management-promo-video-adms-enabled-federation-repositories>

⁴ <https://joinup.ec.europa.eu/elibrary/document/isa-deliverable-process-and-methodology-developing-core-vocabularies>

⁵ <http://www.w3.org/TR/vocab-adms/>

⁶ <http://www.w3.org/2011/gld/>

⁷ W3C. Asset Description Metadata Schema (ADMS). Namespace Document 25 June 2012. <http://www.w3.org/ns/adms>

⁸ http://ec.europa.eu/isa/actions/01-trusted-information-exchange/1-1action_en.htm

⁹ http://ec.europa.eu/isa/documents/isa_annex_ii_eif_en.pdf

¹⁰ http://ec.europa.eu/isa/actions/02-interoperability-architecture/2-1action_en.htm

2. **alignment of ADMS and ADMS.SW** to take a holistic approach and demonstrate how ADMS and ADMS.SW fit together. This is required as the scope of the ADMS extension to all types of interoperability solutions (common frameworks, common services and generic tools) includes the concept of software (See Use case 8: Merging ADMS and ADMS.SW);
3. **ensuring backward compatibility** to make sure that properties and classes introduced in former specifications can still be used.

The extensions are specified based on the collected requirements, which have been gathered in the following documents and activities:

- D1.2 - Survey on repositories and portals of IOP assets and IS¹¹;
- EFIR Survey results¹²;
- D2.1 - Report on the requirement specification workshop¹³; and
- Coordination meetings with other ISA actions.

1.3 Audience

This document is addressed to ICT developers from European public administrations, European institutions, businesses and standardization bodies that would like to describe any types of interoperability assets using ADMS.

1.4 Glossary of terms

TERM	DESCRIPTION
Application Profile	Schema that consists of data elements drawn from one or more namespaces, combined together by implementers, and optimised for a particular local application. (Source: Ariadne ¹⁴)
Asset Description Metadata Schema (ADMS)	Vocabulary to describe interoperability assets making it possible for ICT developers to explore and search for interoperability assets. (Source: Joinup ¹⁵)
Asset Description Metadata Schema for Software (ADMS.SW)	Metadata vocabulary to describe software making it possible to more easily explore, find, and link software on the Web. (Source: Joinup ¹⁶)
Controlled vocabulary	Prescribed list of terms or headings each one having an assigned meaning. (Source: Willpower Information ¹⁷)
Data Catalog Vocabulary (DCAT)	RDF vocabulary designed to facilitate interoperability between data catalogues published on the Web. (Source: W3C ¹⁸)
DCAT Application Profile for data portals in Europe	Specification based on the Data Catalogue vocabulary (DCAT) for describing public sector datasets in Europe. (Source: Joinup ¹⁹)

¹¹ EFIR CC DI06692 CS8 - D1.2 - Survey on repositories and portals of IOP assets and IS, 2013.

¹² EFIR Survey Results, 2013. <https://joinup.ec.europa.eu/asset/adms/document/ec-european-federated-interoperability-repository-efir-survey-results>

¹³ EFIR CC DI06692 CS8 - D2.1 - Report on the requirement specification workshop, 2013.

¹⁴ <http://www.ariadne.ac.uk/issue25/app-profiles>

¹⁵ <https://joinup.ec.europa.eu/asset/adms/description>

¹⁶ https://joinup.ec.europa.eu/asset/adms_foss/description

¹⁷ <http://www.willpowerinfo.co.uk/glossary.htm>

¹⁸ <http://www.w3.org/TR/vocab-dcat/>

¹⁹ https://joinup.ec.europa.eu/asset/dcat_application_profile/description

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TERM	DESCRIPTION
Dublin Core Metadata Initiative (DCMI) metadata terms	Metadata terms maintained by the Dublin Core Metadata Initiative, including properties, vocabulary encoding schemes, syntax encoding schemes, and classes. (Source: DCMI ²⁰)
European Interoperability Framework (EIF)	Approach proposed by the European Commission to facilitate interoperability between organisations that wish to work together towards the joint delivery of public services. Within its scope of applicability, it specifies a set of common elements such as vocabulary, concepts, principles, policies, guidelines, recommendations, standards, specifications and practices. (Source: Europea.eu ²¹)
Friend-of-a-Friend (FOAF) vocabulary	Open, decentralized technology for connecting social Web sites, and the people they describe. (Source: FOAF project ²²)
Functional Requirements for Bibliographic Records (FRBR)	Structured framework for relating the data that are recorded in bibliographic records to the needs of the users of those records. (Source: IFLA ²³)
INSPIRE	Infrastructure for spatial information in Europe to support Community environmental policies, and policies or activities which may have an impact on the environment. (Source: JRC ²⁴)
Interoperability asset	An interoperability asset is an element of an ICT solution (i.e. framework, service or generic tool) that is used in the context of electronic information exchange between public administrations. (Source: D1.1 – Scoping and Project Organisation Report)
Interoperability solution	Synonym for interoperability asset.
Public Sector Information (PSI)	Information, including information products and services, generated, created, collected, processed, preserved, maintained, disseminated, or funded by or for the Government or public institution. (Source: OECD ²⁵)
RDF schema (RDFS)	Vocabulary description language for the Resource Description Framework (RDF) (Source: W3C ²⁶)
Resource Description Framework (RDF)	Standard model for data interchange on the Web. (Source: W3C ²⁷)
Simple Knowledge Organization Schema (SKOS)	Standard way to represent knowledge organization systems using the Resource Description Framework (RDF). (Source: W3C ²⁸)

²⁰ <http://dublincore.org/documents/dcmi-terms/>

²¹ http://ec.europa.eu/isa/documents/isa_annex_ii_eif_en.pdf

²² <http://www.foaf-project.org/>

²³ http://archive.ifla.org/VII/s13/frbr/frbr_current2.htm

²⁴ <http://inspire.jrc.ec.europa.eu/>

²⁵ <http://www.oecd.org/internet/ieconomy/44384673.pdf>

²⁶ <http://www.w3.org/TR/rdf-schema/>

²⁷ <http://www.w3.org/RDF/>

²⁸ <http://www.w3.org/2004/02/skos/intro>

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TERM	DESCRIPTION
Universal Modeling Language (UML)	Graphical language for visualizing, specifying, constructing, and documenting the artifacts of a software-intensive system. The UML offers a standard way to write a system's blueprints, including conceptual things such as business processes and system functions as well as concrete things such as programming language statements, database schemas, and reusable software components. (source: Sparx Systems ²⁹)
VCard	Electronic business card. (Source: IMC ³⁰)

²⁹ <http://www.sparxsystems.com/uml-tutorial.html>

³⁰ <http://www.imc.org/pdi/vcardoverview.html>

2 RELATED WORK

2.1 Activities in the ISA programme

Several related activities have already been identified as sources for the ADMS Application Profile:

- Action 1.1 - Improving semantic interoperability in European eGovernment systems³¹
- Action 1.17 - Re-usable INSPIRE reference platform
- Action 2.1 - European Interoperability Architecture (EIA)³²
- Action 2.14 – Assessment of Trans-European Networks supporting EU policies³³
- Action 2.2 - Common Assessment Methods for Standards and Specifications (CAMSS)³⁴
- Action 4.5.4 – Sharing and reuse strategy³⁵

2.2 Technical specifications

More specific technical activities that relate to the development of the ADMS application profile are:

- The Data Catalog Vocabulary (DCAT)³⁶ – specification of a standard base vocabulary to describe datasets.
- The DCAT Application Profile for data portals in Europe³⁷ – specification that describes the use of the DCAT standard for the particular case of exchange of information between data portals.
- The Asset Description Metadata Schema (ADMS)³⁸ – specification of a vocabulary to describe interoperability assets.
- The Asset Description Metadata Schema for Software (ADMS.SW)³⁹ – specification of a vocabulary to describe software products and projects.
- The Core Public Service Vocabulary⁴⁰ – specification of a vocabulary to describe electronic services.

³¹ http://ec.europa.eu/isa/actions/01-trusted-information-exchange/1-17action_en.htm

³² http://ec.europa.eu/isa/actions/02-interoperability-architecture/2-1action_en.htm

³³ http://ec.europa.eu/isa/actions/02-interoperability-architecture/2-14action_en.htm

³⁴ http://ec.europa.eu/isa/actions/documents/isa_2.2_camss_workprogramme.pdf

³⁵ http://ec.europa.eu/isa/actions/04-accompanying-measures/4-2-5action_en.htm

³⁶ <http://www.w3.org/TR/vocab-dcat/>

³⁷ http://joinup.ec.europa.eu/asset/dcat_application_profile/description

³⁸ <http://www.w3.org/TR/vocab-adms/>

³⁹ http://joinup.ec.europa.eu/asset/adms_foss/release/release100

⁴⁰ https://joinup.ec.europa.eu/asset/core_public_service/description

3 USE CASES AND REQUIREMENTS

The use cases and requirements described in this section are based on discussions during a webinar on 24 April 2013 (the EFIR Workshop 2013)⁴¹ and further discussions with potential users of the extended ADMS specification representing activities on the European level including the actions mentioned in section 2.1 as well as national initiatives. Following the description of each use case, a short note is included on how the particular use case is supported, or how the use case can be supported outside of the extended ADMS specification.

3.1 Use case 1: Grouping assets used in a particular application

In many instances, interoperability assets are not used in isolation. Many are being used in combination with other assets to provide a particular service or support a particular application. Such combinations or groupings of assets represent a certain context for assets. To enable re-use of assets, it may be helpful for users of the EFIR system to be able to find out for a given asset how it is being used in various contexts in combination with other assets, or to browse through such contexts to see how such contexts re-use assets.

This requirement could be met by including a Context class. An instance of the Context class could point to one or more assets that make up the group, point to one or more organisations that use the context and to one or more applications that the context supports. In the description of an asset, a link could be provided to one or more contexts that the assets play a role in.

However, in the EFIR status meeting that was held on 4 September 2013, it has been decided to not introduce 'Context' as a new concept for the following reasons:

- The 'context' concept is vague and therefore difficult to use. It is better to keep metadata on interoperability assets as simple as possible for the users.
- The implementation of a context class would have important costs:
 - **Implementation cost:** Extending the ADMS with a context class would have great impact on implementation of the ADMS on Joinup.
 - **Operational cost:** Including context will require moderation
- The requirement can already be partially fulfilled using the 'related to' property of ADMS (dct:relation) which is already implemented on Joinup.

3.2 Use case 2: Finding related assets

Other than appearing as members of a group of assets in a context as described in section 3.1, assets can also have direct relations with other assets. Examples are a technical tool that uses a semantic schema to support an organisational workflow.

This requirement is met by the property dct:relation in section 8.2.2 which provides a general mechanism for such asset-to-asset relationships. In addition to this general property, a small number of more specific relationships are defined in ADMS (e.g. translation, part of, previous/next/last version, see section 8.2.3). Other relationship can be

⁴¹ <https://joinup.ec.europa.eu/node/64526>, highlight report at https://joinup.ec.europa.eu/sites/default/files/European_Federated_Interoperability_Repository_EFIR_Workshop_Highlight_Report_v1.00_1.pdf

defined outside of the application profile using terms from standard vocabularies or from locally defined vocabularies.

3.3 Use case 3: Extending asset types to all interoperability layers from the EIF and aligning terms to relevant concepts from the EIA taxonomy

The ADMS specification supports the classification of assets according to the European Interoperability Framework (EIF)⁴². The EIF defines five interoperability layers as shown in Figure 1.

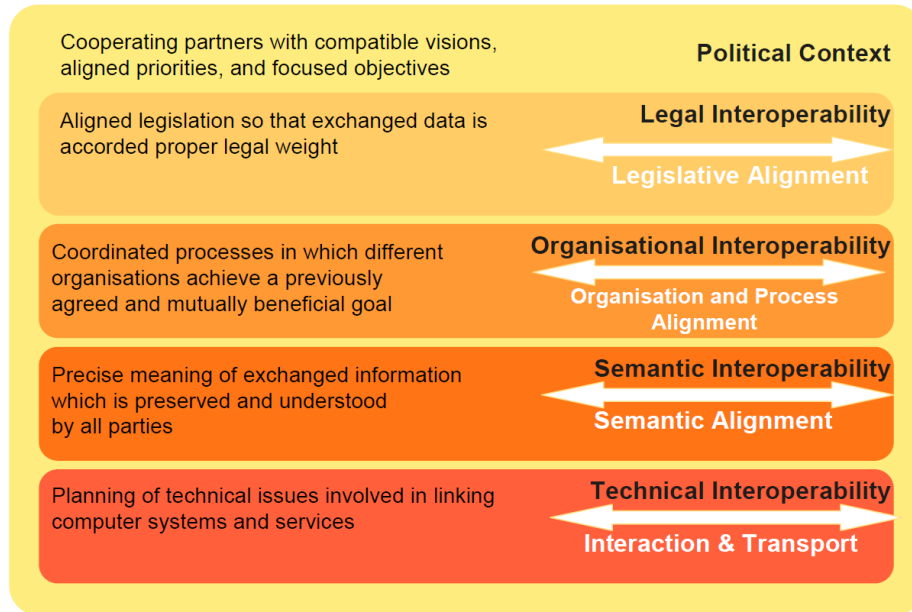


Figure 1: EIF Interoperability layers

The initial release of ADMS⁴³ contains an annex that defines a taxonomy of assets on the semantic interoperability level of the EIF as shown in Figure 2.

⁴² http://ec.europa.eu/isa/documents/isa_annex_ii_eif_en.pdf

⁴³ <https://joinup.ec.europa.eu/asset/adms/release/100>

I.2 ASSET TYPE

Base URI: <http://purl.org/adms/assettype/>

Code	URI
Core Component	http://purl.org/adms/assettype/CoreComponent
Ontology	http://purl.org/adms/assettype/Ontology
Domain Model	http://purl.org/adms/assettype/DomainModel
Schema	http://purl.org/adms/assettype/Schema
Information Exchange Package Description	http://purl.org/adms/assettype/InformationExchangePackageDescription
Thesaurus	http://purl.org/adms/assettype/Thesaurus
Taxonomy	http://purl.org/adms/assettype/Taxonomy
Code List	http://purl.org/adms/assettype/CodeList
Name Authority List	http://purl.org/adms/assettype/NameAuthorityList
Mapping	http://purl.org/adms/assettype/Mapping
Syntax Encoding Scheme	http://purl.org/adms/assettype/SyntaxEncodingScheme
Service Description	http://purl.org/adms/assettype/ServiceDescription

Figure 2: Asset types for EIF Semantic Interoperability layer

A need has been identified for EFIR to define taxonomy terms that would also cover the other interoperability levels. Additionally, an alignment of those terms with the concepts from the EIA building blocks has also been required.

To support this requirement, an extended taxonomy of asset types has been developed which is included in this specification in Annex I. This taxonomy has been updated to cover all layers of interoperability defined in the EIF as well as to take on board relevant concepts from the EIA building blocks.

3.4 Use case 4: Using additional asset classification

A need has been expressed to be able to classify assets using other types of classifications, e.g. in relation to specific taxonomies based on architecture frameworks, types of interoperability solutions or classifications of business processes.

A particular example of a controlled vocabulary to classify assets is the EIA Architectural Framework⁴⁴ of the European Interoperability Architecture (EIA) that is developed for the EU cartography of building blocks. This framework distinguishes a number of architectural views and types of building blocks within those views as shown in Figure 3.

⁴⁴ http://ec.europa.eu/isa/documents/isa_2.1_eia-finalreport-commonvisionforaneia.pdf

Business View	Data View	Application View	Technology View
Users (Citizens and Businesses)	Data translation (layer)	Base registries	Cross-border technical connection
Public administrations	Multilingualism	Orchestration layer	Security functions
European public services	Syntax translation	Secure data exchange	Data transport
Interoperability agreements	Semantic translation	Secure communication management	Structured data storage
Cross-border processes	Semantic schemas	Communications layer	Document storage
Cross-border documents	Catalogue of datasets	External services	Public administration infrastructure
Contact points	Catalogue of reference data	Presentation layer	Integration infrastructure
Business requirements and drivers	Cross-border business data	Presentation logic	Data sources
Legal framework	Semantic schemas	Business logic	Public administration infrastructure
Policy domains		Audit trail and log	Technology View
Cross-border processes		Service registry	
		Data certification	
		Identity and access management	
		Solution components	
		Services layer	
		Basic application service	
		Access to applications	
		Application View	

Figure 3: Taxonomy derived from the building blocks in the EIA Architectural Framework

The requirement to enable the use of multiple asset classifications is met by the possibility to optionally declare additional classifications to be used as described in section 9.2, over and above the mandatory use of the ADMS asset type vocabulary (see section 9.1 and Annex I).

3.5 Use case 5: Expressing re-use conditions and constraints

The EFIR search facility allows users to discover interoperability assets that they may want to re-use. In order to provide users with a clear view of what they can do with an asset they have found, it is necessary that the description of the asset includes a clear statement of the permissions and restrictions concerning the re-use of interoperability assets.

This requirement is met by the property `dct:license` specified in section 8.3.2 that relates the distribution of an asset with a licence such as a Creative Commons⁴⁵ licence or the ISA Open Metadata Licence⁴⁶.

3.6 Use case 6: Linking to policy domains

Users who access EFIR may have a specific interest in assets that are related to a particular policy domain such as health care, justice or environmental issues. It would be useful for them if they could filter the search results by such policy domains.

This requirement is met by the use of the domains of Eurovoc⁴⁷, the mandatory controlled theme vocabulary listed in section 9.1.

3.7 Use case 7: Contacting asset owner

ADMS as specified in this document intends to provide a useful set of descriptors for interoperability assets. However, as the set of descriptors is intended as a common approach across assets of different types, a user who finds a particular asset might have questions about the asset that cannot be answered by the ADMS description. There is an additional possibility for the asset publisher to provide more information by linking the description to a Web page through the property `dc:landingPage` listed in section 8.2.2, but even then, the

⁴⁵ <http://creativecommons.org/>

⁴⁶ <https://joinup.ec.europa.eu/category/licence/isa-open-metadata-licence-v11>

⁴⁷ <http://eurovoc.europa.eu/>

user may have further questions. It would therefore be helpful if the description of the asset contained contact information of the asset owner that the user can use to ask for further information or give feedback on the asset.

This requirement is met by the inclusion the property `dc:contactPoint` specified in 8.2.2 that links to such information.

3.8 Use case 8: Merging ADMS and ADMS.SW

Initially, ADMS has been created to describe semantic interoperability assets and ADMS.SW to describe software. Even though ADMS.SW is based on ADMS, there are some classes and properties that are specific to software.

Today, there is a need to extend ADMS to all types of interoperability solutions. This includes types such as common frameworks, common services and generic tools (See ISA Decision⁴⁸), which includes Software in the definition. It would therefore be relevant to take a holistic approach and investigate (through this Application Profile) whether aligning ADMS and ADMS.SW into one single vocabulary to describe interoperability solutions would make sense for the future extension of Joinup. Of course, this will also require ensuring that Joinup would still be compatible with the older version of ADMS and ADMS.SW.

⁴⁸ DECISION No 922/2009/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 September 2009 on interoperability solutions for European public administrations (ISA)
http://ec.europa.eu/isa/documents/isa_lexuriserv_en.pdf

4 THE ADMS AND ADMS.SW SPECIFICATIONS

The **ADMSv1.00 specification** that resulted from the work of the ADMS Working Group in 2011-2012 is available on Joinup at the following location:

<https://joinup.ec.europa.eu/node/55818/>

The **ADMS.SW specification** resulted from the work of the ADMS for Software Working Group in 2012. For a full description of ADMS.SW please refer to the specification at

<http://purl.org/adms/sw/20120629/>.

The work on **ADMS** was submitted to the Government Linked Data Working Group at W3C. Discussion in that group led to a number of changes in the specification. In particular, the specification was re-written to consider only implementation as an RDF vocabulary. Furthermore, the relationship with the Data Catalog (DCAT) Vocabulary was clarified. In that process, the classes defined in ADMS were declared to be subclasses of DCAT classes, and ADMS itself was considered to be an Application Profile of DCAT. After consideration by the Government Linked Data Working Group in early 2013, the final ADMS specification was published as W3C Working Group Note on 1 August 2013. For a full description of ADMS, please refer to the specification at

<http://www.w3.org/TR/vocab-adms/>.

This application profile ensures compatibility with the former ADMSv1.00 specification and the current ADMS.SW specification. This is done by declaring some classes and properties from these vocabularies as sub classes and sub properties to the current ADMS standard maintained by W3C. These statements are included in sections 7 and 8.

5 TERMINOLOGY USED IN THE APPLICATION PROFILE

In the following sections, classes and properties are grouped under headings 'mandatory', 'recommended' and 'optional'. These terms have the following meaning.

- **Mandatory class:** a receiver of data **MUST** be able to process information about instances of the class; a sender of data **MUST** provide information about instances of the class.
- **Recommended class:** a receiver **MUST** be able to process information about instances of the class; a sender **MUST** provide the information if it is available.
- **Optional class:** a receiver **MUST** be able to process information about instances of the class; a sender **MAY** provide the information but is not obliged to do so.
- **Mandatory property:** a receiver **MUST** be able to process the information for that property; a sender **MUST** provide the information for that property.
- **Recommended property:** a receiver **MUST** be able to process the information for that property; a sender **SHOULD** provide the information for that property if it is available.
- **Optional property:** a receiver **MUST** be able to process the information for that property; a sender **MAY** provide the information for that property but is not obliged to do so.

The meaning of the terms **MUST** and **MAY** in this section and in the following sections are as defined in RFC2119⁴⁹. In the given context, the term "processing" means that receivers must accept incoming data and transparently provide these data to applications and services. It does neither imply nor prescribe what applications and services finally do with the data (parse, convert, store, make searchable, display to users, etc.).

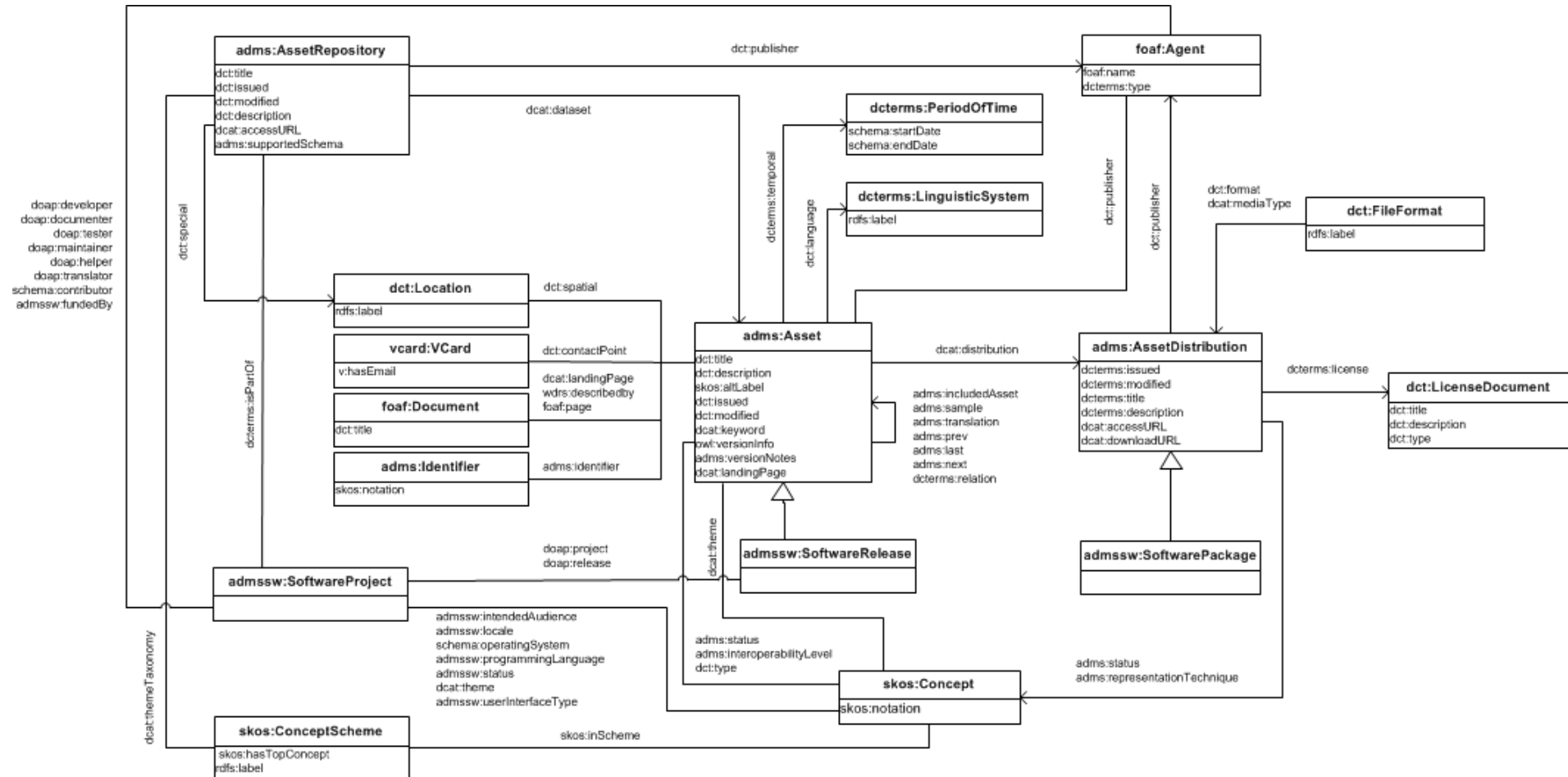
The table below lists the namespace prefixes that are used in the following sections with the corresponding namespaces URIs.

NAMESPACE PREFIX	NAMESPACE URI
adms	http://www.w3.org/ns/adms#
admssw	http://purl.org/adms/sw/
dcat	http://www.w3.org/ns/dcat#
dct	http://purl.org/dc/terms/
doap	http://usefulinc.com/ns/doap#
foaf	http://xmlns.com/foaf/0.1/
qb	http://purl.org/linked-data/cube#
rad	http://www.w3.org/ns/radion#
rdfs	http://www.w3.org/2000/01/rdf-schema#
schema	http://schema.org/
skos	http://www.w3.org/2004/02/skos/core#
spdx	http://spdx.org/rdf/terms#

⁴⁹ IETF. RFC2119. Key words for use in RFCs to Indicate Requirement Levels. <http://www.ietf.org/rfc/rfc2119.txt>

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NAMESPACE PREFIX	NAMESPACE URI
swid	http://standards.iso.org/iso/19770/-2/2009/
trove	http://sourceforge.net/api/trove/index/rdf#
v	http://www.w3.org/2006/vcard/ns#
wdrs	http://www.w3.org/2007/05/powder-s#
xsd	http://www.w3.org/2001/XMLSchema#



7 APPLICATION PROFILE CLASSES

7.1 Mandatory classes

These classes include the Asset class and all classes that appear as the range of mandatory properties in the description of instances of the Asset class.

CLASS NAME	USAGE NOTE FOR THE APPLICATION PROFILE	URI
Asset	<p>Abstract entity that reflects the intellectual content of an Asset and represents those characteristics that are independent of its physical embodiment. This abstract entity combines the FRBR⁵⁰ entities work (a distinct intellectual or artistic creation) and expression (the intellectual or artistic realization of a work).</p> <p>The physical embodiment of an Asset is called an Asset Distribution. A particular Asset may have zero or more Distributions. For the properties to be used with this class see section 0.</p> <p>For backward compatibility, the class adms:SemanticAsset is declared as a subclass of adms:Asset.</p>	adms:Asset
Asset Type	<p>Classification of an Asset according to a controlled vocabulary. For the properties to be used with this class see section 8.5.</p>	skos:Concept
Publisher	<p>Organisation making information available. For the properties to be used with this class see section 8.21.</p>	foaf:Agent
Theme	<p>Concept or subject to which an Asset applies, e.g. "law" or "environment". For the properties to be used with this class see section 8.27.</p>	skos:Concept

7.2 Recommended classes

The Asset Distribution class is classified as Recommended to allow for cases where an Asset does not have a physical embodiment, such as when a description of an Asset is made before the physical file is available, or when the Asset description is maintained after the physical file has been removed. 'Recommended' in this case means that the data provider **MUST** provide a description of the Asset Distribution when it exists.

CLASS NAME	USAGE NOTE FOR THE APPLICATION PROFILE	URI
Asset Distribution	<p>Particular physical embodiment of an Asset, which is an example of the FRBR entity manifestation (the physical embodiment of an expression of a work).</p> <p>A Distribution is typically a downloadable computer file (but in principle it could also be a paper document or API response) that implements the intellectual content of an Asset.</p> <p>A particular Distribution is associated with one and only one Asset, while all Distributions of an Asset share the same intellectual content in different physical formats.</p> <p>For the properties to be used with this class see section 8.3.</p> <p>For backward compatibility, the class adms:SemanticAssetDistribution is declared as a subclass of adms:AssetDistribution.</p>	adms:AssetDistribution

⁵⁰ Cataloguing Section. Functional Requirements for Bibliographic Records, section 3. Entities.
http://archive.ifla.org/VII/s13/frbr/frbr_current3.htm

7.3 Optional classes

These classes include the Asset Repository class and all classes that appear as the range of recommended and optional properties in the description of instances of the Asset class, as well as classes that appear as the range of all properties in the description of instances of all other classes.

CLASS NAME	USAGE NOTE FOR THE APPLICATION PROFILE	URI
Agent	Person or organisation that plays a role in relation to an Asset, e.g. as, funder, developer etc. For the properties to be used with this class see section 8.1.	foaf:Agent
Asset Repository	System or service that provides facilities for storage and maintenance of descriptions of Assets and Asset Distributions, and functionality that allows users to search and access these descriptions. An Asset Repository will typically contain descriptions of several Assets and related Asset Distributions. For the properties to be used with this class see section 8.4. For backward compatibility, the class <code>adms:SemanticAssetRepository</code> and <code>admssw:SoftwareRepository</code> are declared as subclasses of <code>adms:AssetDistribution</code> .	adms:AssetRepository
Checksum	Independently reproducible mechanism that permits unique identification of a specific Software Package. For the properties to be used with this class see section 8.6.	spdx:Checksum
Contact Information	Contact point for further information about an Asset. For the properties to be used with this class see section 8.7.	v:Vcard
Dataset	The Data Set concept represents a multidimensional data structure that contains a variety of measures (e.g. number of lines of code) about the software according to a number of dimensions (e.g. time). It is associated with a Software Project and Software Release via the metrics relationship. For the properties to be used with this class see section 8.7.2	qb:DataSet
Documentation	Document that further describes an Asset or gives guidelines for its use. For the properties to be used with this class see section Error! eference source not found..	foaf:Document
File Format	Technical format in which a Distribution is available, e.g. PDF, XSD etc. For the properties to be used with this class see section 8.10.	dct:FileFormat
Geographical Coverage	Country or region to which an Asset or Repository applies. For the properties to be used with this class see section 8.11.	dct:Location
Identifier	Identifier of an Asset. For the properties to be used with this class see section 8.12.	adms:Identifier
Intended Audience	Intended audience of the software. For the properties to be used with this class see section 8.13	skos:Concept
Interoperability Level	Interoperability level (e.g. legal, organizational, political etc.) of an Asset. For the properties to be used with this class see section 8.14.	skos:Concept

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Language	Language of an Asset that contains textual information, e.g. the language of the terms in a controlled vocabulary or the language in which a document is written. For the properties to be used with this class see section 8.15.	dct:LinguisticSystem
Licence	Conditions or restrictions that apply to the use of a Repository or Distribution, e.g. whether it is in the public domain, or that some restrictions apply such as attribution being required, or that it can only be used for non-commercial purposes etc. For the properties to be used with this class see section 8.16.	dct:LicenseDocument
Locale	Language in which the user interface of software is available. For the properties to be used with this class see section 8.17.	skos:Concept
Operating System	Operating system for which software is built. For the properties to be used with this class see section 8.18.	skos:Concept
Period of time	Time period relevant for an Asset, e.g. for its validity. For the properties to be used with this class see section 8.19.	dct:PeriodOfTime
Programming Language	Programming language in which software is written. For the properties to be used with this class see section 8.20.	skos:Concept
Representation Technique	Machine-readable language in which a Distribution is expressed. For the properties to be used with this class see section 8.22.	skos:Concept
Software Package	A Software Package represents a particular physical embodiment of a Software Release, which is an example of the FRBR entity manifestation (the physical embodiment of an expression of a work). A Software Package is typically a downloadable computer file (but in principle it could also be a paper document) that implements the intellectual content of a Software Release. A particular Software Package is associated with one and only one Software Release, while all Packages of a Release share the same intellectual content in different physical formats. An example of a Software Package is <code>httpd-2.2.22.tar.gz</code> , which represents the Unix Source of the Apache HTTP Server 2.22.22 (<code>httpd</code>) software release. The Software Package class is a subclass of Asset Distribution class. For the properties to be used with this class see section 8.23.	admssw:SoftwarePackage
Software Project	Time-delimited undertaking with the objective to produce one or more Software Releases, materialised as Software Packages. Some projects are long-running undertakings, and do not have a clear time-delimited nature or project organisation. In this case, the term 'project' can be interpreted as the result of the work: a collection of related Software Releases that serve a common purpose. For the properties to be used with this class see section 8.24.	admssw:SoftwareProject
Software Release	Abstract entity that reflects the intellectual content of the software and represents those characteristics of the software that are independent of its physical embodiment. This abstract entity corresponds to the FRBR entity expression (the intellectual or artistic realization of a work). An example of a Software Release is the Apache HTTP Server 2.22.22 (<code>httpd</code>) release. The Software Release class is a subclass of the Asset class and therefore inherits all the latter's properties and relationships. For the properties to be used with this class see section 8.25.	admssw:SoftwareRelease

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Software Repository	System or service that provides facilities for storage and maintenance of descriptions of Software Projects, Software Releases and Software Packages, and functionality that allows users to search and access these descriptions. A Software Repository will typically contain descriptions of several Software Projects, Software Releases and related Software Packages. The Software Repository class is a subclass of the Asset Repository class. For the properties to be used with this class see section 8.4.	admssw:SoftwareRepository
Status	Indication of the maturity of an Asset, a Distribution or a Software Project. For the properties to be used with this class see section 8.25.	skos:Concept
Theme Taxonomy	Controlled vocabulary that contains terms that are used as Themes for the Assets in a Repository. For the properties to be used with this class see section 8.28.	skos:ConceptScheme
User Interface Type	Type of human-machine interaction that the software supports. For the properties to be used with this class see section 8.29.	skos:Concept

8 APPLICATION PROFILE PROPERTIES PER CLASS

8.1 Agent

8.1.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
foaf:name	rdfs:Literal	name of the person or organisation	0..n
dct:type	dct:terms	the type of agent	0..n

8.2 Asset

8.2.1 Mandatory properties

PROPERTY	RANGE	USAGE NOTE	CARD.
dc:theme	skos:Concept	theme or sector to which the Asset applies, using a controlled vocabulary (see section 9.1) For backward compatibility rad:theme is declared as a sub property of dc:theme.	1..n
dct:description	rdfs:Literal	descriptive text for the Asset	1..n
dct:modified	rdfs:Literal typed as xsd:dateTime	date of latest update of Asset	1..1
dct:publisher	foaf:Agent	organisation making the Asset available	1..n
dct:title	rdfs:Literal	name of the Asset	1..n
dct:type	skos:Concept	type of the Asset, using a controlled vocabulary (see section 9.1)	1..n

8.2.2 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
adms:status	skos:Concept	status of the Asset in the context of a particular workflow process, using a controlled vocabulary (see section 9.1)	0..1
adms:interoperabilityLevel	skos:Concept	interoperability level for which the Asset is relevant, using a controlled vocabulary (see section 9.1)	0..n
dc:contactPoint	v:VCard	contact point for further information about the Asset, where errors can be reported or suggestions can be made	0..1

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PROPERTY	RANGE	USAGE NOTE	CARD.
dcate:distribution	adms:AssetDistribution	implementation of the Asset in a particular format For backward compatibility rad:distribution is declared as a sub property of dcat:distribution.	0..n
dcate:keyword	rdfs:Literal	word of phrase to describe the Asset For backward compatibility rad:keyword is declared as a sub property of dcat:keyword.	0..n
dcate:landingPage	foaf:Document	Web page that contains information related to the Asset	0..1
dct:language	dct:LinguisticSystem	language of the Asset, using a controlled vocabulary (see section 9.1)	0..1
dct:relation	rdfs:Resource	related resource, in particular a related asset	0..n
dct:spatial	dct:Location	geographic region or jurisdiction to which the Asset applies, using a controlled vocabulary (see section 9.1)	0..n
dct:temporal	dct:PeriodOfTime	time period relevant to the Asset, e.g. its validity	0..n

8.2.3 Optional properties

PROPERTY	RANGE	USAGE NOTE	CARD.
adms:identifier	adms:Identifier	identifier for the Asset	0..n
adms:includedAsset	adms:Asset	an Asset that is contained in the Asset being described	0..n
adms:last	adms:Asset	current or latest version of the Asset	0..1
adms:next	adms:Asset	newer version of the Asset	0..n
adms:prev	adms:Asset	older version of the Asset	0..n
adms:sample	adms:Asset	sample of an Asset	0..n
adms:translation	adms:Asset	translation of the Asset	0..n
adms:versionNotes	rdfs:Literal	description of changes between this version and the previous version of the Asset	0..1
dct:issued	rdfs:Literal typed as xsd:date	date of formal issuance of this version of the Asset	0..1
foaf:page	foaf:Document	documentation that contains information related to the asset	0..n
owl:versionInfo	rdfs:Literal	version number or other designation of the Asset	0..n
skos:altLabel	rdfs:Literal	alternative name for the Asset	0..n
wrds:describedBy	foaf:Document	main documentation or specification of the Asset	0..1
adms:metrics	dcat:dataset	metrics regarding the Asset	0..n

8.3 Asset Distribution

8.3.1 Mandatory properties

PROPERTY	RANGE	USAGE NOTE	CARD.
dcats:accessURL	rdfs:Resource	URL of the Distribution	1..n

8.3.2 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
adms:status	skos:Concept	status of the Distribution in the context of a particular workflow process, using a controlled vocabulary (see section 9.1)	0..1
dcats:downloadURL	rdfs:Resource	direct link to a downloadable file in a given format	0..n
dcats:mediaType	dct:FileFormat	media type of the Distribution as defined by IANA ⁵¹ , using a controlled vocabulary (see section 9.1)	0..1
dct:license	dct:LicenseDocument	conditions or restrictions for (re-)use of the Distribution	0..1

8.3.3 Optional properties

PROPERTY	RANGE	USAGE NOTE	CARD.
adms:representationTechnique	skos:Concept	language in which the Distribution is expressed, using a controlled vocabulary (see section 9.1) Note: this is different from the file format, e.g. a ZIP file (file format) could contain an XML schema (representation technique)	0..1
dct:description	rdfs:Literal	descriptive text for the Distribution	0..n
dct:format	dct:FileFormat	file format of the Distribution, using a controlled vocabulary (see section 9.1)	0..1
dct:issued	rdfs:Literal typed as xsd:dateTime	date of formal issuance of the Distribution	0..n
dct:modified	rdfs:Literal typed as xsd:dateTime	date of latest update of the Distribution	0..1
dct:publisher	foaf:Agent	organisation making the Distribution available	0..n
dct:title	rdfs:Literal	name of the Distribution	0..n
schema:fileSize	schema:fileSize	size of the file of the distribution	0..1
spdx:checksum	spdx:checksum	checksum of the distribution	0..1
admssw:tagURL	admssw:tagURL	tagURL of the distribution	0..1

⁵¹ IANA (Internet Assigned Numbers Authority). MIME Media Types. <http://www.iana.org/assignments/media-types>

8.4 Asset Repository

8.4.1 Mandatory properties

PROPERTY	RANGE	USAGE NOTE	CARD.
dcats:accessURL	rdfs:Resource	URL of the Repository	1..n
dcats:contactPoint	v:VCard	contact point for further information about the Repository	1..n
dct:description	rdfs:Literal	descriptive text for the Repository	1..n
dct:modified	rdfs:Literal typed as xsd:dateTime	date of latest update of the Repository	1..1
dct:publisher	foaf:Agent	organisation making the Repository available	1..n
dct:title	rdfs:Literal	name of the Repository	1..n

8.4.2 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
dcats:dataset	adms:Asset	an Asset included in the Repository	0..n
dcats:themeTaxonomy	skos:ConceptScheme	Concept Scheme used to classify an Asset Repository's assets, using a controlled vocabulary (see section 9.1) For backward compatibility rad:themeTaxonomy is declared as a sub property of dcats:themeTaxonomy.	0..n
dct:spatial	dct:Location	geographic region or jurisdiction to which the Repository applies, using a controlled vocabulary (see section 9.1)	0..n

8.4.3 Optional properties

PROPERTY	RANGE	USAGE NOTE	CARD.
adms:supportedSchema	adms:Asset	schema according to which the Repository can provide data	0..n
dct:issued	rdfs:Literal typed as xsd:dateTime	date of formal issuance of the Repository	0..n

8.5 Asset Type

8.5.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal	label for the Asset Type	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Asset Type is included	0..n

8.6 Checksum

8.6.1 Mandatory properties

PROPERTY	RANGE	USAGE NOTE	CARD.
algorithm	spdx:checksumAlgorithm_sha1	SHA-1 is the only supported algorithm	1..1
checksumValue	rdfs:Literal typed as xsd:hexBinary	lower case hexadecimal encoded digest value produced using a specific algorithm	1..1

8.7 Contact Information

8.7.1 Mandatory properties

PROPERTY	RANGE	USAGE NOTE	CARD.
v:hasEmail	v:Email	e-mail address where comments and question for an Asset or Repository can be sent	1..n

8.7.2 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
vcard:hasAddress	v:Adr	full address of the contact	0..n
vcard:formattedName	v:name	full name of the contact	0..n
vcard:telephone	v:tel	telephone number of the contact	0...n
vcard:url	v:url	webpage of the contact	0...n

8.8 Dataset

8.8.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
dct:title	rdfs:Literal	name for the Dataset	0..n
rdfs:label	rdfs:Literal	label for the Dataset; may be same as dct:title	0..n
dct:description	rdfs:Literal	description of the Dataset	0..n
rdfs:comment	rdfs:Literal	description of the Dataset; may be same as dct:description	0..n
dct:issued	rdfs:Literal typed as xsd:dateTime	date that the Dataset was issued	0..1
dct:modified	rdfs:Literal typed as xsd:dateTime	date that the Dataset was modified	0..n

PROPERTY	RANGE	USAGE NOTE	CARD.
dct:subject	skos:Concept	theme to which the Dataset is related	0..n
dct:publisher	foaf:Agent	person or organisation making the Dataset available	0..n
dct:license	dct:LicenseDocument	conditions or restrictions for (re-)use of the Dataset	0..1

8.9 Documentation

8.9.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
dct:title	rdfs:Literal	title of the document	0..n

8.10 File Format

8.10.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
rdfs:label	rdfs:Literal	label for the File Format	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the File Format is included	0..n

8.11 Geographical Coverage

8.11.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
rdfs:label	rdfs:Literal	label for the Location	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Geographical Coverage is included	0..n

8.12 Identifier

8.12.1 Mandatory properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal with datatype reflecting the identifier scheme	character string for the identifier	1..1

8.13 Intended Audience

8.13.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal	label for the Intended Audience	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Intended Audience is included	0..n

8.14 Interoperability Level

8.14.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
rdfs:label	rdfs:Literal	label for the Interoperability Level	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Interoperability Level is included	0..n

8.15 Language

8.15.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal	label for the Language	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Language is included	0..n

8.16 Licence

8.16.1 Mandatory properties

PROPERTY	RANGE	USAGE NOTE	CARD.
dct:type	skos:Concept	type of the licence, using a controlled vocabulary (see section 9.1)	1..1
skos:inScheme	skos:ConceptScheme	concept scheme in which the Language is included	0..n

8.16.2 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
rdfs:label	rdfs:Literal	label for the Licence	0..n
dct:description	rdfs:Literal	description of the Licence	0..n

8.17 Locale

8.17.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal	label for the Locale	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Locale is included	0..n

8.18 Operating System

8.18.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal	label for the Operating System	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Operating System is included	0..n

8.19 Period of time

8.19.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
schema:endDate	rdfs:Literal typed as xsd:dateTime	end date of the Period	0..1
schema:startDate	rdfs:Literal typed as xsd:dateTime	start date of the Period	0..1

Please note that while both properties are optional, one of the two **MUST** be present. The start of the period should be understood as the start of the date, hour, minute etc. given (e.g. starting at midnight at the beginning of the day if the value is a date); the end of the period should be understood as the end of the date, hour, minute etc. given (e.g. ending at midnight at the end of the day if the value is a date)

8.20 Programming Language

8.20.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal	label for the Programming Language	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Programming Language is included	0..n

8.21 Publisher

8.21.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
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PROPERTY	RANGE	USAGE NOTE	CARD.
dct:type	skos:Concept	type of the Publisher, using a controlled vocabulary (see section 9.1)	0..n
foaf:name	rdfs:Literal	name of the Publisher	0..n

8.22 Representation Technique

8.22.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal	label for the Representation Technique	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Representation Technique is included	0..n

8.23 Software Package

The Software Package class is a subclass of the Asset Distribution class and therefore inherits all the latter's properties and relationships. See section 8.3 for the list of mandatory, recommended and optional properties for this class.

In addition to the properties listed in section 8.3, the following properties are defined for this subclass.

8.23.1 Additional optional properties

PROPERTY	RANGE	USAGE NOTE	CARD.
doap:release	admssw:SoftwareRelease	the Software Release that this Software Package embodies. This is the reverse relationship of package	0..1
swid:software_id	swid:SoftwareId	identifier of the software package according to the ISO19770-2:2009 software identifying system	0..1
admssw:tagURL	rdfs:Resource	URL from which a software tag file can be obtained for the Software Package. Note: several software tag standards exist such as the ISO19770-2:2009, the ISO19770-3 and the SPDX specification. These standards do not require the software tags to be available on via the Web.	0..n
schema:fileSize	rdfs:Literal typed as xsd:int	size of the package file in bytes	0..1
spdx:checksum	spdx:Checksum	The checksum property provides a mechanism that can be used to verify that the contents of a Package have not been changed.	0..1

8.24 Software Project

8.24.1 Mandatory properties

PROPERTY	RANGE	USAGE NOTE	CARD.
doap:name	rdfs:Literal	name of the Software Project	1..n

8.24.2 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
dct:description	rdfs:Literal	description of the Software Project	0..n
foaf:logo		logo of the Software Project	0..n

8.24.3 Optional properties

PROPERTY	RANGE	USAGE NOTE	CARD.
doap:release	admssw:SoftwareRelease	software release that the project has produced	0..n
schema:contributor	foaf:Agent	contributing person or organisation for the project	0..n
admssw:fundedBy	foaf:Agent	source of funding (person or organisation) for the project	0..n
doap:developer	foaf:Agent	person who developed the software	0..n
doap:documenter	foaf:Agent	person who documented the software	0..n
doap:maintainer	foaf:Agent	person who maintains the software	0..n
doap:helper	foaf:Agent	person who helps with the software	0..n
doap:tester	foaf:Agent	person who tests the software	0..n
doap:translator	foaf:Agent	person who translates the software	0..n
admssw:metrics	qb:DataSet	dataset of metrics about the software	0..n
dcat:theme	skos:Concept	topic, theme or function of the software	0..n
admssw:intendedAudience	skos:Concept	intended audience of the software	0..n
admssw:locale	skos:Concept	a locale of the software	0..n
admssw:userInterfaceType	skos:Concept	user interface type of the software	0..n
admssw:programmingLanguage	skos:Concept	programming language of the software	0..n
dcterms:isPartof	admssw:SoftwareRepository	Software forge or repository that contains the primary description of the Software Release	0..n
schema:operatingSystem	skos:Concept	operating system of the software	0..n
adms:status	skos:Concept	status of the software	0..n

PROPERTY	RANGE	USAGE NOTE	CARD.
admssw:supportsFormat	dct:FileFormat	data format that is supported by the software	0..n

8.25 Software Release

The Software Release class is a subclass of the Asset class and therefore inherits all the latter's properties and relationships. See section 0 for the list of mandatory, recommended and option properties for this class.

In addition to the properties listed in section 0, the following properties are defined for this subclass.

8.25.1 Additional recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
admsw:package	admssw:SoftwarePackage	Implementation of the Software Release that can be downloaded.	0..n
admssw:project	admssw:SoftwareProject	project that has produced the Asset	0..n

8.26 Status

8.26.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
rdfs:label	rdfs:Literal	label for the Status	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Status is included	0..n

8.27 Theme

8.27.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal	label for the Theme	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the Theme is included	0..n

8.28 Theme Taxonomy

8.28.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
rdfs:label	rdfs:Literal	label for the Theme Taxonomy	0..n
skos:hasTopConcept	rdfs:Literal	concept that is the top level of the Theme Taxonomy	0..n

8.29 User Interface Type

8.29.1 Recommended properties

PROPERTY	RANGE	USAGE NOTE	CARD.
skos:notation	rdfs:Literal	label for the User Interface Type	0..n
skos:inScheme	skos:ConceptScheme	concept scheme in which the User Interface Type is included	0..n

9 CONTROLLED VOCABULARIES

9.1 Controlled vocabularies to be used

In the table below, properties are listed with controlled vocabularies that MUST be used.

PROPERTY URI	USED FOR CLASS	VOCABULARY	VOCABULARY URI
adms:interoperabilityLevel	Asset	ADMS Interoperability Level vocabulary	http://purl.org/adms/interoperabilitylevel/
adms:representationTechnique	Asset Distribution	ADMS Representation Technique Vocabulary	http://purl.org/adms/representationtechnique/
adms:status	Asset, Asset Distribution	ADMS Status vocabulary	http://purl.org/adms/status/
adms:status	Software Project	Trove Sourceforge Development Status vocabulary ⁵²	http://sourceforge.net/api/trove/index/rdf#6
admssw:intendedAudience	Software Project	Trove Sourceforge Intended Audience vocabulary ⁵³	http://sourceforge.net/api/trove/index/rdf#1
admssw:locale	Software Project	MDR Languages Named Authority List ⁵⁴	http://publications.europa.eu/resource/authority/language
admssw:programmingLanguage	Software Project	Trove Sourceforge Programming Language vocabulary ⁵⁵	http://sourceforge.net/api/trove/index/rdf#160
admssw:userInterfaceType	Software Project	Trove Sourceforge User Interface / Graphical Environment vocabulary ⁵⁶	http://sourceforge.net/api/trove/index/rdf#225
dcat:mediaType	Asset Distribution	MDR File Type Name Authority List ⁵⁷	http://publications.europa.eu/resource/authority/file-type
dcat:theme	Asset	EuroVoc domains ⁵⁸	http://eurovoc.europa.eu/100142 through 100162
dcat:theme	Software Project	Trove Sourceforge Topic vocabulary	http://sourceforge.net/api/trove/index/rdf#18

⁵² European Commission. Joinup. ADMS.SW Metadata Vocabulary and Software Taxonomies. https://joinup.ec.europa.eu/svn/adms_foss/amds_sw_taxonomies/ADMS_SW_v1-00_Taxonomies.html

⁵³ Ibid.

⁵⁴ Publications Office of the EU. Metadata Registry. Authorities. Languages. <http://publications.europa.eu/mdr/authority/language/>

⁵⁵ European Commission. Joinup. ADMS.SW Metadata Vocabulary and Software Taxonomies. https://joinup.ec.europa.eu/svn/adms_foss/amds_sw_taxonomies/ADMS_SW_v1-00_Taxonomies.html

⁵⁶ European Commission. Joinup. ADMS.SW Metadata Vocabulary and Software Taxonomies. https://joinup.ec.europa.eu/svn/adms_foss/amds_sw_taxonomies/ADMS_SW_v1-00_Taxonomies.html

⁵⁷ Publications Office of the EU. Metadata Registry. Authorities. File types. <http://publications.europa.eu/mdr/authority/file-type/>

⁵⁸ Europa. Eurovoc. Domains. <http://eurovoc.europa.eu/drupal/?q=navigation&cl=en>

PROPERTY URI	USED FOR CLASS	VOCABULARY	VOCABULARY URI
dcat:themeTaxonomy	Asset Repository	EuroVoc ⁵⁹	http://eurovoc.europa.eu/
dct:format	Asset Distribution	MDR File Type Named Authority List	http://publications.europa.eu/resource/authority/file-type
dct:language	Asset	MDR Languages Named Authority List	http://publications.europa.eu/resource/authority/language
dct:spatial	Asset, Asset Repository	MDR Countries Named Authority List ⁶⁰ , MDR Places Named Authority List ⁶¹	http://publications.europa.eu/resource/authority/country , http://publications.europa.eu/resource/authority/place/
dct:type	Asset	ADMS Asset Type vocabulary	http://purl.org/adms/assettype/ (see note) http://purl.org/adms/solutiontype/
dct:type	Licence Document	ADMS Licence Type vocabulary	http://purl.org/adms/licencetype/
dct:type	Publisher	ADMS Publisher Type vocabulary	http://purl.org/adms/publishertype/
schema:operatingSystem	Software Project	Trove Sourceforge Operating System vocabulary ⁶²	http://sourceforge.net/api/truve/index/rdf#199

Note: An interoperability solution (adms:Asset) can be classified both using the Solution Type and Solution Category taxonomies. The Solution Category taxonomy has been adopted from the ISA Decision; a complete of all the terms is included in Annex I. The Asset Type vocabulary of ADMS has been extended to cover all interoperability levels as well as to take on board a maximum of relevant concepts from the EIA building blocks. This resulted in the Solution Type vocabulary. A complete list of all the terms in the Solution Type vocabulary is included in Annex II.

9.2 Other controlled vocabularies

In addition to the proposed common vocabularies in section 9.1, further region or domain-specific vocabularies MAY be used. While those may not be recognised by general implementations of the Application Profile, they may serve to increase interoperability across applications in the same region or domain. Examples are the full set of concepts in Eurovoc, the CERIF standard vocabularies⁶³, the Dewey Decimal Classification⁶⁴ and numerous other schemes.

⁵⁹ Europa. Eurovoc, the EU's multilingual thesaurus. <http://eurovoc.europa.eu/>

⁶⁰ Publications Office of the EU. Metadata Registry. Authorities. Countries.

<http://publications.europa.eu/mdr/authority/country/>

⁶¹ Publications Office of the EU. Metadata Registry. Authorities. Places. <http://publications.europa.eu/mdr/authority/place/>

⁶² European Commission. Joinup. ADMS.SW Metadata Vocabulary and Software Taxonomies.

https://joinup.ec.europa.eu/svn/adms_foss/amds_sw_taxonomies/ADMS_SW_v1-00_Taxonomies.html

⁶³ http://www.eurocris.org/Uploads/Web%20pages/CERIF-1.5/CERIF1.5_Semantics.xhtml

⁶⁴ OCLC. Dewey Summaries as Linked Data. <http://www.oclc.org/dewey/webservices.en.html> and <http://dewey.info/>

Such vocabularies and classifications can be used if they are defined as SKOS⁶⁵ Concept Schemes where the classification terms (modelled as SKOS Concepts) can be referenced by their URIs.

⁶⁵ W3C. Simple Knowledge Organization System Reference. <http://www.w3.org/TR/skos-reference/>

10 CONFORMANCE STATEMENT

In order to conform to this Application Profile, an application that provides metadata **MUST**:

- For all instances of the mandatory Asset class, provide data for at least the mandatory properties specified in section 8.2.1
- For all instances of the recommended Asset Distribution class, if available, provide data for at least the mandatory properties specified in section 8.3.1
- For all instances of the optional Asset Repository class, provide data for at least the mandatory properties specified in section 8.4.1
- For all instances of the optional Checksum class, provide data for at least the mandatory properties specified in section 8.6.1
- For all instances of the optional Contact Information class, provide data for at least the mandatory property specified in section 8.7.1
- For all instances of the optional Identifier class, provide data for at least the mandatory property specified in section 8.12.1
- For all instances of the optional Licence class, provide data for at least the mandatory property specified in section 8.16.1
- For all instances of the optional Period of Time class, provide data for at least one of the optional properties specified in section 8.19.1
- For all instances of the optional Software Package class, provide data for at least the mandatory properties of the Asset Distribution class specified in section 8.3.1
- For all instances of the optional Software Project class, provide data for at least the mandatory properties specified in section 8.24.1
- For all instances of the optional Software Release class, provide data for at least the mandatory properties of the Asset class specified in section 8.2.1

In addition to the mandatory properties, any of the recommended and optional properties defined in chapter 8 **MAY** be provided.

For the properties listed in the table in section 9.1, the associated controlled vocabularies **MUST** be used. Additional controlled vocabularies **MAY** be used.

In addition to the classes and properties specified in section 8, other classes and properties **MAY** be used by an application without breaking conformance to this application profile.

10.1 Receiver requirements

In order to conform to this Application Profile, an application that receives metadata **MUST** be able to:

- Process information for all classes specified in section 7.
- Process information for all properties specified in section 8.
- Process information for all controlled vocabularies specified in section 9.1.

As stated in section 5, "processing" means that receivers must accept incoming data and transparently provide these data to applications and services. It does neither imply nor prescribe what applications and services finally do with the data (parse, convert, store, make searchable, display to users, etc.).

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The table below lists all people that have participated to the EFIR survey and EFIR Workshop, as they all have provided some valuable input for this document.

NAME	STAKEHOLDER TYPE	ORGANISATION	SURVEY	WORKSHOP
Miguel Álvarez Rodríguez	European Institutions	DIGIT	No	Yes
Landen Bain	Standardisation body	CDSIC	No	Yes
John Borrás	Standardisation body	OASIS	No	Yes
Peter Burian	European Institutions	DIGIT Action 2.1	No	Yes
Gerald Cultot	European Institutions	DG CONNECT	No	Yes
Makx Dekkers	European Institutions	DIGIT	No	Yes
Heather Flanagan	Standardisation body	RFC Series Editor	No	Yes
Muriel Foulonneau	European Institutions	SPOCS	No	Yes
Sébastien Gallezot	European Institutions	DIGIT Action 2.14	Yes	Yes
Andreas Gehlert	Member State	DE - Federal Ministry of the Interior	Yes	No
Bart Hanssens	Member State	BE - Fedict	Yes	Yes
Linda Humphries	Member State	UK - Cabinet Office	No	Yes
Pieter-Jan Beyls	European Institutions	DIGIT	No	Yes
Anne Kauhanen-Simanainen	Member State	FI - Ministry of Finance, Public Sector ICT	Yes	No
Paulo Lobo	Member State	PT - AMA	Yes	No
Michel Martin	European Institutions	DIGIT Action 2.14	No	Yes
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Robin Smith	Member State	UK - Listpoint	No	Yes
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Willem van Gemert	European Institutions	Publications Office	No	Yes
Andy Waters	Member State	UK - The Home Office	No	Yes
Milan Zoric	Standardisation body	ETSI	No	Yes

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ANNEX I. SOLUTION CATEGORY

CODE	URI - DEFINITION
(Common) Framework	<p>URI: http://purl.org/adms/solutiontype/Framework Definition: 'common frameworks' means strategies, specifications, methodologies, guidelines and similar approaches and documents Source: ISA Decision⁶⁶ Related terms: strategies, specifications, methodologies, guidelines</p>
(Generic) Tool	<p>URI: http://purl.org/adms/solutiontype/Tool Definition: 'generic tools' means reference platforms, shared and collaborative platforms, common components and similar building blocks which meet common user requirements across policy areas Source: ISA Decision Related terms: reference platforms, shared and collaborative platforms, common components, building blocks</p>
(Common) Service	<p>URI: http://purl.org/adms/solutiontype/Service Definition: 'common services' means operational applications and infrastructures of a generic nature which meet common user requirements across policy areas Source: ISA Decision Related terms: applications, infrastructures</p>

⁶⁶ DECISION No 922/2009/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 September 2009 on interoperability solutions for European public administrations (ISA)
http://ec.europa.eu/isa/documents/isa_lexuriserv_en.pdf

ANNEX II. COMPLETE LIST OF TERMS IN THE ADMSX SOLUTION TYPE VOCABULARY

A need has been identified for EFIR to define taxonomy terms that would also cover the other interoperability levels. Additionally, an alignment of those terms with the concepts from the EIA building blocks has also been required (See Use case 3: Extending asset types to all interoperability layers from the EIF and aligning terms to relevant concepts from the EIA taxonomy)

The following table presents the extended taxonomy of asset types. It has been updated to cover all layers of interoperability defined in the EIF as well as to take on board relevant concepts from the EIA building blocks.

Please note that the Governance, Business, Data, Application and Technology views are only indicative at this stage. They are not asset types but rather 'containers' of architectural building blocks, meaning one of the possible ways of grouping the different asset types. These views have been used for the purpose of building an extended taxonomy that would take into account, as much as possible, the input from the EIA taxonomy.

CODE	URI
Governance view	
Policy	URI: http://purl.org/adms/assettype/Policy Source: D1.1 – Scoping and Project Organisation Report Related terms: Action Plan, Cross-level interoperability Framework, International Agreement, National Policy, EU Policy, EU Treaty
Legal Framework	URI: http://purl.org/adms/assettype/LegalFramework Source: EIA Related terms :
Law	URI: http://purl.org/adms/assettype/Law Source: EUR-Lex Related terms : EU Case Law, EU Decision, EU Directive, EU Opinion, EU Recommendation, EU Resolution, EU Regulation, National Case Law, National Legislative Act
Licensing Framework	URI: http://purl.org/adms/assettype/LicensingFramework Source: D1.1 – Scoping and Project Organisation Report Related terms :
Licence template	URI: http://purl.org/adms/assettype/LicenceTemplate Source: D1.1 – Scoping and Project Organisation Report Related terms :
Contributor agreement template	URI: http://purl.org/adms/assettype/ContributorAgreementTemplate Source: D1.1 – Scoping and Project Organisation Report Related terms:
Contract template	URI: http://purl.org/adms/assettype/ContractTemplate Source: D1.1 – Scoping and Project Organisation Report Related terms : Cooperation Contract, Memorandum of Understanding

D3.1 – Extended ADMS specification

CODE	URI
Service Level Agreement template	URI: http://purl.org/adms/assettype/ServiceLevelAgreementTemplate Source: D1.1 – Scoping and Project Organisation Report, OASIS TGF Related terms
Business View	
Business Requirements	URI: http://purl.org/adms/assettype/BusinessRequirements Source: EIA Related terms :
Process Description	URI : http://purl.org/adms/assettype/ProcessDescription Source : D1.1 – Scoping and Project Organisation Report, Zachman Enterprise Framework Related terms : Business process model
Organisation Structure and Roles	URI: http://purl.org/adms/assettype/OrganisationStructureAndRoles Source: D1.1 – Scoping and Project Organisation Report, Zachman Enterprise Framework Related terms:
Data view	
Data Model	URI: http://purl.org/adms/assettype/DataModel Source: ADMS v1.00 Related terms:
Core Component	URI: http://purl.org/adms/assettype/CoreComponent Source: ADMS v1.00 Related terms:
Ontology	URI: http://purl.org/adms/assettype/Ontology Source: ADMS v1.00 Related terms:
Domain Model	URI: http://purl.org/adms/assettype/DomainModel Source: ADMS v1.00 Related terms:
Schema	URI: http://purl.org/adms/assettype/Schema Source: ADMS v1.00 Related terms:
Information Exchange Package Description	URI: http://purl.org/adms/assettype/InformationExchangePackageDescription Source: ADMS v1.00 Related terms:
Reference data	URI: http://purl.org/adms/assettype/ReferenceData Source: ADMS v1.00 Related terms:
Thesaurus	URI: http://purl.org/adms/assettype/Thesaurus Source: ADMS v1.00 Related terms:

D3.1 – Extended ADMS specification

CODE	URI
Taxonomy	URI: http://purl.org/adms/assettype/Taxonomy Source: ADMS v1.00 Related terms:
Code List	URI: http://purl.org/adms/assettype/CodeList Source: ADMS v1.00 Related terms:
Name Authority List	URI: http://purl.org/adms/assettype/NameAuthorityList Source: ADMS v1.00 Related terms:
Mapping	URI: http://purl.org/adms/assettype/Mapping Source: ADMS v1.00 Related terms:
Syntax Encoding Scheme	URI: http://purl.org/adms/assettype/SyntaxEncodingScheme Source: ADMS v1.00 Related terms:
Application View	
Basic service	URI: http://purl.org/adms/assettype/BasicService Source: EIF, EIA Related terms:
Service registry	URI: http://purl.org/adms/assettype/ServiceRegistry Source: SAS Related terms: Register of public services
Software	URI: http://purl.org/adms/assettype/Software Source: Related terms: Tool (see also ADMS.SW and the "software topic" taxonomy)
Presentation logic	URI: http://purl.org/adms/assettype/PresentationLogic Source: EIA Related terms: presentation guidelines, accessibility guidelines
Audit trail and logging	URI: http://purl.org/adms/assettype/AuditTrailAndLogging Source: EIA Related terms:
Technology view	
Secure Information Exchange solution	URI: http://purl.org/adms/assettype/SecureInformationExchangeSolution Source: EIA Related terms: e-Delivery, Communications Layer (EIA), Protocol, ...
Orchestration solution	URI: http://purl.org/adms/assettype/OrchestrationSolution Source: EIA Related terms: e-Interaction

D3.1 – Extended ADMS specification

CODE	URI
Storage solution	URI: http://purl.org/adms/assettype/StorageSolution Source: EIA Related terms: document storage
Digital signature solution	URI: http://purl.org/adms/assettype/DigitalSignatureSolution Source: Related terms: e-Signature
Identity and Access solution	URI: http://purl.org/adms/assettype/IdentityAndAccessSolution Source: EIA, TOGAF Related terms: eID