*SC118DI07171*

D02.03.2: Updated specification DCAT-AP

DCAT Application Profile for data portals in Europe

Version 1.1

Document Metadata

|  |  |
| --- | --- |
| Property | Value |
| Date | 2015-10-09 |
| Status | Final |
| Version | 0.11 |
| Rights | © 2015 European Union |
| Licence | ISA Open Metadata Licence v1.1, retrievable from <https://joinup.ec.europa.eu/category/licence/isa-open-metadata-licence-v11>. |
| Access URL | This specification can be downloaded from the Joinup web site:  <https://joinup.ec.europa.eu/node/137964/> |

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# Introduction

## Context

This document has been prepared in the context of Action 1.1 – Improving semantic interoperability in European eGovernment systems[[1]](#footnote-1) of the European Commission’s Interoperability Solutions for European Public Administrations (ISA) programme[[2]](#footnote-2).

Studies conducted on behalf of the European Commission[[3]](#footnote-3) show that businesses and citizens still face difficulties in finding and re-using public sector information. In its communication on Open Data[[4]](#footnote-4) of 12 December 2011, the European Commission states that the availability of the information in a machine-readable format as well as a thin layer of commonly agreed metadata could facilitate data cross-reference and interoperability and therefore considerably enhance its value for reuse.

Much of the public sector information that would benefit from interoperability is published as datasets in data portals. Therefore, an agreement on a common format for data exchange would support the sharing, discovery and re-use of this data.

This document is the result of a revision in 2015 of the first version of the agreement that was published in September 2013[[5]](#footnote-5).

## Scope of the revision

The objective of this work is to produce an updated release of the DCAT Application Profile based on requests for change coming from real-world implementations of the specification.

The Application Profile specified in this document is based on the specification of the **Data Catalog Vocabulary** (DCAT) developed under the responsibility of the Government Linked Data Working Group[[6]](#footnote-6) at W3C. The work on DCAT was initiated[[7]](#footnote-7) at the Digital Enterprise Research Institute (DERI) and the Greek National Centre for Public Administration and Decentralization. DCAT is an RDF[[8]](#footnote-8) vocabulary designed to facilitate interoperability between data catalogues published on the Web. Additional classes and properties from other well-known vocabularies are re-used where necessary.

The Working Group that worked on the revision of the Application Profile took into account the following criteria in deciding which changes to make to the specification:

1. **Improve the discovery of datasets.** Priority was given to those aspects that can be used in searching and navigating and requests that had to do with dataset management and operational issues were not considered. Some implementation advice of a general nature was included but no further deployment advice for specific operational environments was added.
2. **Ensure compliance with DCAT.** Requests that aimed at changing the model of DCAT or replacing properties that already existed in DCAT by others with similar semantics were not taken into account. Only elements have been added that could be re-used from existing namespaces and no new terms were created in a new namespace.
3. **Ensure simplicity: keep a narrow scope.** Only elements were added for which there was evidence that they were needed and that the information was commonly available in existing systems; if there were several ways to meet a requirement, the simplest one was chosen.
4. **Ensure application domain neutrality.** Requests that were only relevant for certain types of datasets were not considered. In particular, requirements that were related to geographic characteristics and to handling of statistical data were referred to parallel activities, GeoDCAT-AP[[9]](#footnote-9) and StatDCAT-AP.

The work does not cover implementation issues like mechanisms for exchange of data and expected behaviour of systems implementing the Application Profile other than what is defined in the Conformance Statement in section6.

The Application Profile is intended to facilitate data exchange and therefore the classes and properties defined in this document are only relevant for the data to be exchanged; there are no requirements for communicating systems to implement specific technical environments. The only requirement is that the systems can export and import data in RDF in conformance with this Application Profile.

## Change management process

The work is conducted according to the change management process for structural metadata that was developed by the ISA Programme of the European Commission. Firstly, the methodology prescribes a governance structure for managing changes and releases. Secondly, it specifies specific processes for managing changes in specifications, for managing the preparation of releases of specification, and for managing the process of publication of a releases.

Based on the governance structure as prescribed in the ISA methodology, the following governance levels, activities and roles have been identified for the revision process of the DCAT Application Profile:

Table : Governance structure for the revision of DCAT-AP

|  |  |  |
| --- | --- | --- |
| Governance level | Activities | Who |
| **Steering Committee (SC)** | * Approve general directions * Stay informed about activities and progress * Endorse new release | ISA Coordination Group, PSI Expert Group (DG CNECT) |
| **Governance Committee (GC)** | * Organise & safeguard proper execution of maintenance activities * Identify need for revision * Instruct the Operational Team to apply changes * Establish Working Groups * Prepare release for Steering Committee endorsement | ISA Programme Management Team |
| **Operational Team (OT)** | * Gather change requests * Advise Governance Committee on nature of changes * Provide the editor for Working Groups * Document the resolution of change requests | Contractor of ISA action 1.1. |
| **Working Group (WG)** | * Bring expertise * Reach consensus | * Chair: Norbert Hohn, Willem Van Gemert (Publications Office of the EU) * Editor: Makx Dekkers * Organisations implementing the specification * Individual experts |

The ISA change management methodology identified five phases in the change management and release process. These phases will apply to the revision of the DCAT Application Profile:

1. **Request handling**

This phase starts with the receipt of requests for change (RFC) from stakeholders. A log of all change requests received will be made available via Joinup[[10]](#footnote-10). The requests are evaluated by the Operational Team (OT) and grouped into issues on Joinup[[11]](#footnote-11). Based on the analysis by the OT, the Governance Committee (GC) decides on the further process. If the request is rejected because it is not clear or not relevant for the specification at hand, the GC informs the submitter of the rejection with a justification. If the request is accepted, the GC will schedule the request for inclusion in a new release.

1. **Request resolution**

In order to resolve the requests for semantic changes, the GC establishes a Working Group (WG). The WG elaborates one or more drafts of the revised specification and discusses these drafts until consensus is reached. It then submits the draft to the GC who publishes the draft for public review. The WG resolves any comments and finalises the new specification. The process continues with the Release preparation phase.

1. **Release preparation**

The GC instructs the OT to prepare the specification and any additional documentation. The GC notifies the Steering Committee (SC) that the new release is ready for publication and requests endorsement by the SC.

1. **Release endorsement**

The SC discusses the new release and endorses its publication.

1. **Release publication**

Following endorsement by the SC, the GC publishes the new release and notifies the stakeholders and the wider public of its availability. The new release of the DCAT-AP will be made available on Joinup[[12]](#footnote-12).

## The DCAT specification

The specification of the Data Catalog Vocabulary (DCAT) was published by W3C as a W3C Recommendation on 16 January 2014[[13]](#footnote-13).

The DCAT Application Profile defined in this document is based on this officially published version.

# Terminology used in the DCAT Application Profile

An **Application Profile** is a specification that re-uses terms from one or more base standards, adding more specificity by identifying mandatory, recommended and optional elements to be used for a particular application, as well as recommendations for controlled vocabularies to be used.

A **Dataset** is a collection of data, published or curated by a single source, and available for access or download in one or more formats.

A **Data Portal** is a Web-based system that contains a data catalogue with descriptions of datasets and provides services enabling discovery and re-use of the datasets.

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 sender of data should provide information about instances of the class; a sender of data must provide information about instances of the class, if such information is available; a receiver of data must be able to process information about instances of the class.
* **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, must not, should and may in this section and in the following sections are as defined in RFC 2119[[14]](#footnote-14).

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.).

Classes are classified as ‘Mandatory’ in section 3.1 if they appear as the range of one of the mandatory properties in section 4.

The class ‘Distribution’ is classified as ‘Recommended’ in section 3.2 to allow for cases that a particular Dataset does not have a downloadable Distribution, and in such cases the sender of data would not be able to provide this information. However, it can be expected that in the majority of cases Datasets do have downloadable Distributions, and in such cases the provision of information on the Distribution is mandatory.

All other classes are classified as ‘Optional’ in section 3.3. A further description of the optional classes is only included as a sub-section in section 4 if the Application Profile specifies mandatory or recommended properties for them.

The Application Profile reuses terms from various existing specifications. Classes and properties specified in the next sections have been taken from the following namespaces:

* adms: [http://www.w3.org/ns/adms#](http://www.w3.org/ns/adms)
* dcat: [http://www.w3.org/ns/dcat#](http://www.w3.org/ns/dcat)
* dct: <http://purl.org/dc/terms/>
* foaf: <http://xmlns.com/foaf/0.1/>
* owl: [http://www.w3.org/2002/07/owl#](http://www.w3.org/2002/07/owl)
* rdfs: [http://www.w3.org/2000/01/rdf-schema#](http://www.w3.org/2000/01/rdf-schema)
* schema: <http://schema.org/>
* skos: [http://www.w3.org/2004/02/skos/core#](http://www.w3.org/2004/02/skos/core)
* spdx: [http://spdx.org/rdf/terms#](http://spdx.org/rdf/terms)
* xsd: [http://www.w3.org/2001/XMLSchema#](http://www.w3.org/2001/XMLSchema)
* vcard: [http://www.w3.org/2006/vcard/ns#](http://www.w3.org/2006/vcard/ns)

Application Profile classes shows a UML diagram of all classes and properties included in the DCAT Application Profile.

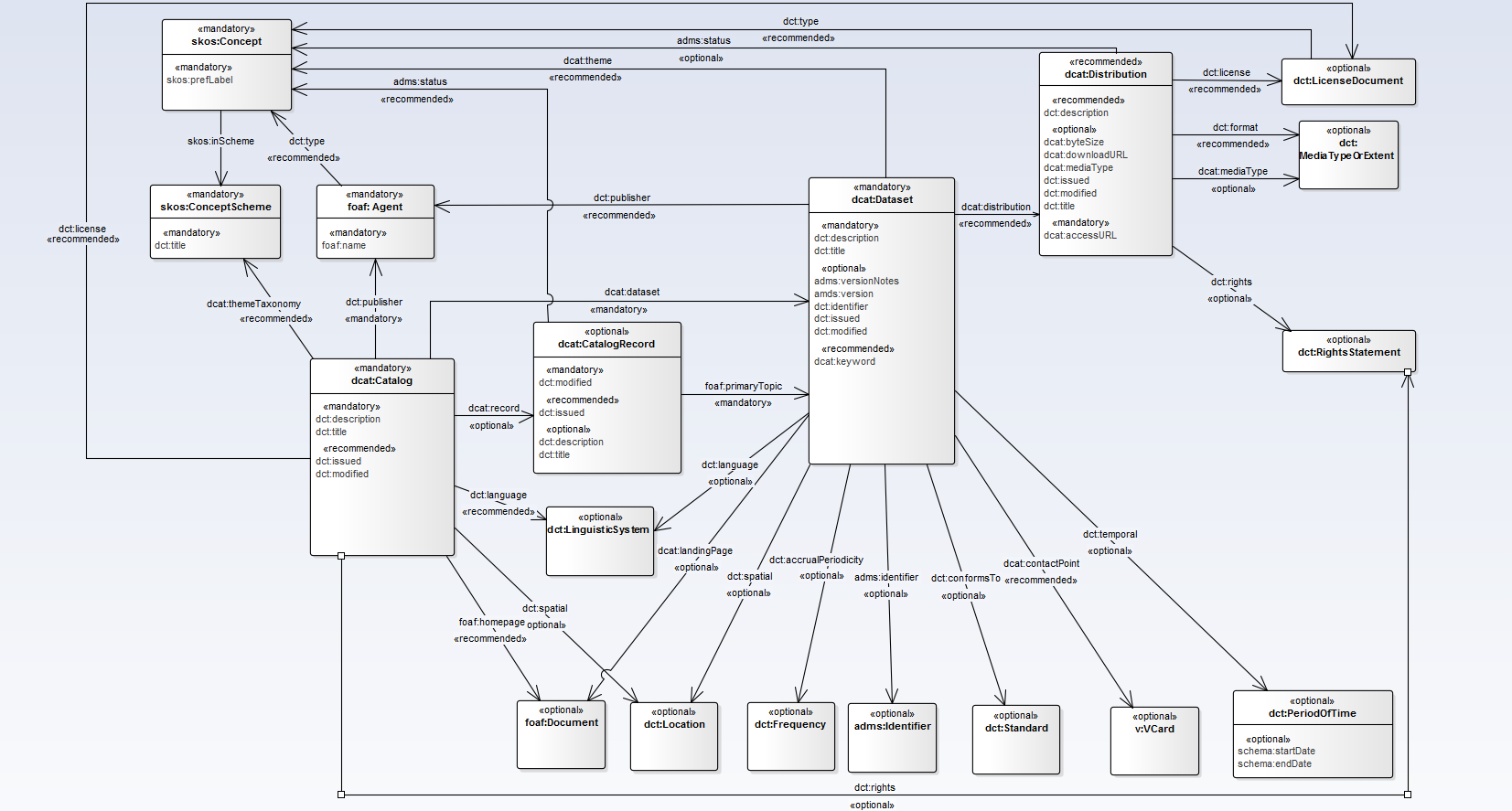


Figure - DCAT Application Profile UML Class Diagram

# Application Profile classes

## Mandatory Classes

| Class name | Usage note for the Application Profile | URI | Reference |
| --- | --- | --- | --- |
| Agent | An entity that is associated with Catalogues and/or Datasets. If the Agent is an organisation, the use of the Organization Ontology[[15]](#footnote-15) is recommended. See section 7 for a discussion on Agent roles. | foaf:Agent | <http://xmlns.com/foaf/spec/#term_Agent> , <http://www.w3.org/TR/vocab-org/> |
| Category | A subject of a Dataset. | skos:Concept | <http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-category-and-category-scheme> |
| Category scheme | A concept collection (e.g. controlled vocabulary) in which the Category is defined. | skos:ConceptScheme | <http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-category-and-category-scheme> |
| Catalogue | A catalogue or repository that hosts the Datasets being described. | dcat:Catalog | <http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-catalog> |
| Dataset | A conceptual entity that represents the information published. | dcat:Dataset | <http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-dataset> |
| Literal | A literal value such as a string or integer; Literals may be typed, e.g. as a date according to xsd:date. Literals that contain human-readable text have an optional language tag as defined by BCP 47[[16]](#footnote-16). | rdfs:Literal | <http://www.w3.org/TR/rdf-concepts/#section-Literals> |
| Resource | Anything described by RDF. | rdfs:Resource | <http://www.w3.org/TR/rdf-schema/#ch_resource> |

## Recommended Classes

| Class name | Usage note for the Application Profile | URI | Reference |
| --- | --- | --- | --- |
| Distribution | A physical embodiment of the Dataset in a particular format. | dcat:Distribution | <http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-distribution> |
| Licence document | A legal document giving official permission to do something with a resource. | dct:LicenseDocument | <http://dublincore.org/documents/2012/06/14/dcmi-terms/?v=terms#LicenseDocument> |

## Optional Classes

|  |  |  |  |
| --- | --- | --- | --- |
| Class name | Usage note for the Application Profile | URI | Reference |
| Catalogue Record | A description of a Dataset’s entry in the Catalogue. | dcat:CatalogRecord | <http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-catalog-record> |
| Checksum | A value that allows the contents of a file to be authenticated. This class allows the results of a variety of checksum and cryptographic message digest algorithms to be represented. | spdx:Checksum | <http://spdx.org/rdf/terms#Checksum> |
| Document | A textual resource intended for human consumption that contains information, e.g. a web page about a Dataset. | foaf:Document | <http://xmlns.com/foaf/spec/#term_Document> |
| Frequency | A rate at which something recurs, e.g. the publication of a Dataset. | dct:Frequency | <http://dublincore.org/documents/dcmi-terms/#terms-Frequency> |
| Identifier | An identifier in a particular context, consisting of the string that is the identifier; an optional identifier for the identifier scheme; an optional identifier for the version of the identifier scheme; an optional identifier for the agency that manages the identifier scheme | adms:Identifier | <http://www.w3.org/TR/vocab-adms/#identifier> |
| Kind | A description following the vCard specification, e.g. to provide telephone number and e-mail address for a contact point. Note that the class Kind is the parent class for the four explicit types of vCards (Individual, Organization, Location, Group). | vcard:Kind | <http://www.w3.org/TR/2014/NOTE-vcard-rdf-20140522/#d4e181> |
| Linguistic system | A system of signs, symbols, sounds, gestures, or rules used in communication, e.g. a language | dct:LinguisticSystem | <http://dublincore.org/documents/dcmi-terms/#terms-LinguisticSystem> |
| Location | A spatial region or named place. It can be represented using a controlled vocabulary or with geographic coordinates. In the latter case, the use of the Core Location Vocabulary[[17]](#footnote-17) is recommended, following the approach described in the GeoDCAT-AP specification. | dct:Location | <http://dublincore.org/documents/dcmi-terms/#terms-Location> |
| Media type or extent | A media type or extent, e.g. the format of a computer file | dct:MediaTypeOrExtent | <http://dublincore.org/documents/dcmi-terms/#terms-MediaTypeOrExtent> |
| Period of time | An interval of time that is named or defined by its start and end dates. | dct:PeriodOfTime | <http://dublincore.org/documents/dcmi-terms/#terms-PeriodOfTime> |
| Publisher type | A type of organisation that acts as a publisher | skos:Concept | <http://www.w3.org/TR/vocab-adms/#dcterms-type> |
| Rights statement | A statement about the intellectual property rights (IPR) held in or over a resource, a legal document giving official permission to do something with a resource, or a statement about access rights. | dct:RightsStatement | <http://dublincore.org/documents/dcmi-terms/#terms-RightsStatement> |
| Standard | A standard or other specification to which a Dataset or Distribution conforms | dct:Standard | <http://dublincore.org/documents/dcmi-terms/#terms-Standard> |
| Status | An indication of the maturity of a Distribution or the type of change of a Catalogue Record. | skos:Concept | <http://www.w3.org/TR/vocab-adms/#status> |

# DCAT Application Profile Properties per Class

A quick reference table of properties per class is included in Annex I.

## Catalogue

### Mandatory properties for Catalogue

| Property | URI | Range | Usage note | Card. |
| --- | --- | --- | --- | --- |
| dataset | dcat:dataset | dcat:Dataset | This property links the Catalogue with a Dataset that is part of the Catalogue. | 1..n |
| description | dct:description | rdfs:Literal | This property contains a free-text account of the Catalogue. This property can be repeated for parallel language versions of the description. For further information on multilingual issues, please refer to section 8. | 1..n |
| publisher | dct:publisher | foaf:Agent | This property refers to an entity (organisation) responsible for making the Catalogue available. | 1..1 |
| title | dct:title | rdfs:Literal | This property contains a name given to the Catalogue. This property can be repeated for parallel language versions of the name. | 1..n |

### Recommended properties for Catalogue

| Property | URI | Range | Usage note | Card. |
| --- | --- | --- | --- | --- |
| homepage | foaf:homepage | foaf:Document | This property refers to a web page that acts as the main page for the Catalogue. | 0..1 |
| language | dct:language | dct:LinguisticSystem | This property refers to a language used in the textual metadata describing titles, descriptions, etc. of the Datasets in the Catalogue. This property can be repeated if the metadata is provided in multiple languages. | 0..n |
| licence | dct:license | dct:LicenseDocument | This property refers to the licence under which the Catalogue can be used or reused. | 0..1 |
| release date | dct:issued | rdfs:Literal typed as xsd:date or xsd:dateTime | This property contains the date of formal issuance (e.g., publication) of the Catalogue. | 0..1 |
| themes | dcat:themeTaxonomy | skos:ConceptScheme | This property refers to a knowledge organization system used to classify the Catalogue's Datasets. | 0..n |
| update/ modification date | dct:modified | rdfs:Literal typed as xsd:date or xsd:dateTime | This property contains the most recent date on which the Catalogue was modified. | 0..1 |

### Optional properties for Catalogue

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card. |
| has part | dct:hasPart | dcat:Catalog | This property refers to a related Catalogue that is part of the described Catalogue | 0..n |
| is part of | dct:isPartOf | dcat:Catalog | This property refers to a related Catalogue in which the described Catalogue is physically or logically included. | 0..1 |
| record | dcat:record | dcat:CatalogRecord | This property refers to a Catalogue Record that is part of the Catalogue | 0..n |
| rights | dct:rights | dct:RightsStatement | This property refers to a statement that specifies rights associated with the Catalogue. | 0..1 |
| spatial / geographic | dct:spatial | dct:Location | This property refers to a geographical area covered by the Catalogue. | 0..n |

## Catalogue Record

### Mandatory properties for Catalogue Record

| Property | URI | Range | Usage note | Card. |
| --- | --- | --- | --- | --- |
| primary topic | foaf:primaryTopic | dcat:Dataset | This property links the Catalogue Record to the Dataset described in the record. | 1..1 |
| update/ modification date | dct:modified | rdfs:Literal typed as xsd:date or xsd:dateTime | This property contains the most recent date on which the Catalogue entry was changed or modified. | 1..1 |

### Recommended properties for Catalogue Record

| Property | URI | Range | Usage note | Card. |
| --- | --- | --- | --- | --- |
| application profile | dct:conformsTo | rdfs:Resource | This property refers to an Application Profile that the Dataset’s metadata conforms to | 0..1 |
| change type | adms:status | skos:Concept | This property refers to the type of the latest revision of a Dataset's entry in the Catalogue. It MUST take one of the values :created, :updated or :deleted depending on whether this latest revision is a result of a creation, update or deletion. | 0..1 |
| listing date | dct:issued | rdfs:Literal typed as xsd:date or xsd:dateTime | This property contains the date on which the description of the Dataset was included in the Catalogue. | 0..1 |

### Optional properties for Catalogue Record

| Property | URI | Range | Usage note | Card. |
| --- | --- | --- | --- | --- |
| description | dct:description | rdfs:Literal | This property contains a free-text account of the record. This property can be repeated for parallel language versions of the description. | 0..n |
| language | dct:language | dct:LinguisticSystem | This property refers to a language used in the textual metadata describing titles, descriptions, etc. of the Dataset. This property can be repeated if the metadata is provided in multiple languages. | 0..n |
| source metadata | dct:source | dcat:CatalogRecord | This property refers to the original metadata that was used in creating metadata for the Dataset | 0..1 |
| title | dct:title | rdfs:Literal | This property contains a name given to the Catalogue Record. This property can be repeated for parallel language versions of the name. | 0..n |

## Dataset

### Mandatory properties for Dataset

| Property | URI | Range | Usage note | Card |
| --- | --- | --- | --- | --- |
| description | dct:description | rdfs:Literal | This property contains a free-text account of the Dataset. This property can be repeated for parallel language versions of the description. | 1..n |
| title | dct:title | rdfs:Literal | This property contains a name given to the Dataset. This property can be repeated for parallel language versions of the name. | 1..n |

### Recommended properties for Dataset

| Property | URI | Range | Usage note | Card |
| --- | --- | --- | --- | --- |
| contact point | dcat:contactPoint | vcard:Kind | This property contains contact information that can be used for sending comments about the Dataset. | 0..n |
| dataset distribution | dcat:distribution | dcat:Distribution | This property links the Dataset to an available Distribution. | 0..n |
| keyword/ tag | dcat:keyword | rdfs:Literal | This property contains a keyword or tag describing the Dataset. | 0..n |
| publisher | dct:publisher | foaf:Agent | This property refers to an entity (organisation) responsible for making the Dataset available. | 0..1 |
| theme/ category | dcat:theme, subproperty of dct:subject | skos:Concept | This property refers to a category of the Dataset. A Dataset may be associated with multiple themes. | 0..n |

### Optional properties for Dataset

| Property | URI | Range | Usage note | Card. |
| --- | --- | --- | --- | --- |
| access rights | dct:accessRights | dct:RightsStatement | This property refers to information that indicates whether the Dataset is open data, has access restrictions or is not public. A controlled vocabulary with three members (:public, :restricted, :non-public) will be created and maintained by the Publications Office of the EU. | 0..1 |
| conforms to | dct:conformsTo | dct:Standard | This property refers to an implementing rule or other specification. | 0..n |
| documentation | foaf:page | foaf:Document | This property refers to a page or document about this Dataset. | 0..n |
| frequency | dct:accrualPeriodicity | dct:Frequency | This property refers to the frequency at which the Dataset is updated. | 0..1 |
| has version | dct:hasVersion | dcat:Dataset | This property refers to a related Dataset that is a version, edition, or adaptation of the described Dataset. | 0..n |
| identifier | dct:identifier | rdfs:Literal | This property contains the main identifier for the Dataset, e.g. the URI or other unique identifier in the context of the Catalogue. | 0..n |
| is version of | dct:isVersionOf | dcat:Dataset | This property refers to a related Dataset of which the described Dataset is a version, edition, or adaptation. | 0..n |
| landing page | dcat:landingPage | foaf:Document | This property refers to a web page that provides access to the Dataset, its Distributions and/or additional information. It is intended to point to a landing page at the original data provider, not to a page on a site of a third party, such as an aggregator. | 0..n |
| language | dct:language | dct:LinguisticSystem | This property refers to a language of the Dataset. This property can be repeated if there are multiple languages in the Dataset. | 0..n |
| other identifier | adms:identifier | adms:Identifier | This property refers to a secondary identifier of the Dataset, such as MAST/ADS[[18]](#footnote-18), DataCite[[19]](#footnote-19), DOI[[20]](#footnote-20), EZID[[21]](#footnote-21) or W3ID[[22]](#footnote-22). | 0..n |
| provenance | dct:provenance | dct:ProvenanceStatement | This property contains a statement about the lineage of a Dataset. | 0..n |
| related resource | dct:relation | rdfs:Resource | This property refers to a related resource. | 0..n |
| release date | dct:issued | rdfs:Literal typed as xsd:dateTime | This property contains the date of formal issuance (e.g., publication) of the Dataset. | 0..1 |
| sample | adms:sample | dcat:Distribution | This property refers to a sample distribution of the dataset | 0..n |
| source | dct:source | dcat:Dataset | This property refers to a related Dataset from which the described Dataset is derived. | 0..n |
| spatial/ geographical coverage | dct:spatial | dct:Location | This property refers to a geographic region that is covered by the Dataset. | 0..n |
| temporal coverage | dct:temporal | dct:PeriodOfTime | This property refers to a temporal period that the Dataset covers. | 0..n |
| type | dct:type | skos:Concept | This property refers to the type of the Dataset. A controlled vocabulary for the values has not been established. | 0..1 |
| update/ modification date | dct:modified | rdfs:Literal typed as xsd:date or xsd:dateTime | This property contains the most recent date on which the Dataset was changed or modified. | 0..1 |
| version | owl:versionInfo | rdfs:Literal | This property contains a version number or other version designation of the Dataset. | 0..1 |
| version notes | adms:versionNotes | rdfs:Literal | This property contains a description of the differences between this version and a previous version of the Dataset. This property can be repeated for parallel language versions of the version notes. | 0..n |

## Distribution

### Mandatory properties for Distribution

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card |
| access URL | dcat:accessURL | rdfs:Resource | This property contains a URL that gives access to a Distribution of the Dataset. The resource at the access URL may contain information about how to get the Dataset. | 1..n |

### Recommended properties for Distribution

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card |
| description | dct:description | rdfs:Literal | This property contains a free-text account of the Distribution. This property can be repeated for parallel language versions of the description. | 0..n |
| format | dct:format | dct:MediaTypeOrExtent | This property refers to the file format of the Distribution. | 0..1 |
| licence | dct:license | dct:LicenseDocument | This property refers to the licence under which the Distribution is made available. | 0..1 |

### Optional properties for Distribution

| Property | URI | Range | Usage note | Card. |
| --- | --- | --- | --- | --- |
| byte size | dcat:byteSize | rdfs:Literal typed as xsd:decimal | This property contains the size of a Distribution in bytes. | 0..1 |
| checksum | spdx:checksum | spdx:Checksum | This property provides a mechanism that can be used to verify that the contents of a distribution have not changed | 0..1 |
| documentation | foaf:page | foaf:Document | This property refers to a page or document about this Distribution. | 0..n |
| download URL | dcat:downloadURL | rdfs:Resource | This property contains a URL that is a direct link to a downloadable file in a given format. | 0..n |
| language | dct:language | dct:LinguisticSystem | This property refers to a language used in the Distribution. This property can be repeated if the metadata is provided in multiple languages. | 0..n |
| linked schemas | dct:conformsTo | dct:Standard | This property refers to an established schema to which the described Distribution conforms. | 0..n |
| media type | dcat:mediaType, subproperty of dct:format | dct:MediaTypeOrExtent | This property refers to the media type of the Distribution as defined in the official register of media types managed by IANA. | 0..1 |
| release date | dct:issued | rdfs:Literal typed as xsd:date or xsd:dateTime | This property contains the date of formal issuance (e.g., publication) of the Distribution. | 0..1 |
| rights | dct:rights | dct:RightsStatement | This property refers to a statement that specifies rights associated with the Distribution. | 0..1 |
| status | adms:status | skos:Concept | This property refers to the maturity of the Distribution | 0..1 |
| title | dct:title | rdfs:Literal | This property contains a name given to the Distribution. This property can be repeated for parallel language versions of the description. | 0..n |
| update/ modification date | dct:modified | rdfs:Literal typed as xsd:date or xsd:dateTime | This property contains the most recent date on which the Distribution was changed or modified. | 0..1 |

## Agent

### Mandatory property for Agent

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card. |
| name | foaf:name | rdfs:Literal | This property contains a name of the agent. This property can be repeated for different versions of the name (e.g. the name in different languages) | 1..n |

### Recommended property for Agent

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card. |
| type | dct:type | skos:Concept | This property refers to a type of the agent that makes the Catalogue or Dataset available | 0..1 |

## Category Scheme

### Mandatory property for Category Scheme

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card. |
| title | dct:title | rdfs:Literal | This property contains a name of the category scheme. May be repeated for different versions of the name | 1..n |

## Category

### Mandatory property for Category

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card. |
| preferred label | skos:prefLabel | rdfs:Literal | This property contains a preferred label of the category. This property can be repeated for parallel language versions of the label. | 1..n |

## Checksum

### Mandatory properties for Checksum

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card. |
| algorithm | spdx:algorithm | spdx:checksumAlgorithm\_sha1 | This property identifies the algorithm used to produce the subject Checksum. Currently, SHA-1 is the only supported algorithm. It is anticipated that other algorithms will be supported at a later time. | 1..1 |
| checksum value | spdx:checksumValue | rdfs:Literal typed as xsd:hexBinary | This property provides a lower case hexadecimal encoded digest value produced using a specific algorithm. | 1..1 |

## Identifier

### Mandatory property for Identifier

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card. |
| notation | skos:notation | rdfs:Literal typed with the URI of one of the members of the DataCite Resource Identifier Scheme[[23]](#footnote-23) | This property contains a string that is an identifier in the context of the identifier scheme referenced by its datatype. | 0..1 |

## Licence Document

### Recommended property for Licence Document

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card. |
| licence type | dct:type | skos:Concept | This property refers to a type of licence, e.g. indicating ‘public domain’ or ‘royalties required’. | 0..1 |

## Period of Time

### Optional properties for Period of Time

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property | URI | Range | Usage note | Card. |
| start date/time | schema:startDate | rdfs:Literal typed as xsd:date or xsd:dateTime | This property contains the start of the period | 0..1 |
| end date/time | schema:endDate | rdfs:Literal typed as xsd:date or xsd:dateTime | This property contains the end of the period | 0..1 |
| Please note that while both properties are optional, one of the two must be present for each instance of the class dct:PeriodOfTime, if such an instance is 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) | | | | |

# Controlled Vocabularies

## Requirements for controlled vocabularies

The following is a list of requirements that were identified for the controlled vocabularies to be recommended in this Application Profile.

Controlled vocabularies should:

* Be published under an open licence.
* Be operated and/or maintained by an institution of the European Union, by a recognised standards organisation or another trusted organisation.
* Be properly documented.
* Have labels in multiple languages, ideally in all official languages of the European Union.
* Contain a relatively small number of terms (e.g. 10-25) that are general enough to enable a wide range of resources to be classified.
* Have terms that are identified by URIs with each URI resolving to documentation about the term.
* Have associated persistence and versioning policies.

These criteria do not intend to define a set of requirements for controlled vocabularies in general; they are only intended to be used for the selection of the controlled vocabularies that are proposed for this Application Profile.

## Controlled vocabularies to be used

In the table below, a number of properties are listed with controlled vocabularies that must be used for the listed properties. The declaration of the following controlled vocabularies as mandatory ensures a minimum level of interoperability.

| Property URI | Used for Class | Vocabulary name | Vocabulary URI | Usage note |
| --- | --- | --- | --- | --- |
| dcat:mediaType | Distribution | IANA Media Types[[24]](#footnote-24) | <http://www.iana.org/assignments/media-types/media-types.xhtml> |  |
| dcat:theme | Dataset | Dataset Theme Vocabulary | <http://publications.europa.eu/resource/authority/data-them>e, see Annex II. | The values to be used for this property are the URIs of the concepts in the vocabulary. |
| dcat:themeTaxonomy | Catalogue | Dataset Theme Vocabulary | <http://publications.europa.eu/resource/authority/data-theme>, see Annex II. | The value to be used for this property is the URI of the vocabulary itself, i.e. the concept scheme, not the URIs of the concepts in the vocabulary. |
| dct:accrualPeriodicity | Dataset | MDR Frequency Named Authority List[[25]](#footnote-25) | <http://publications.europa.eu/mdr/authority/frequency> |  |
| dct:format | Distribution | MDR File Type Named Authority List[[26]](#footnote-26) | <http://publications.europa.eu/mdr/authority/file-type/> |  |
| dct:language | Catalogue, Dataset | MDR Languages Named Authority List[[27]](#footnote-27) | <http://publications.europa.eu/mdr/authority/language/> |  |
| dct:publisher | Catalogue, Dataset | MDR Corporate bodies Named Authority List[[28]](#footnote-28) | <http://publications.europa.eu/mdr/authority/corporate-body/> | The Corporate bodies NAL must be used for European institutions and a small set of international organisations. In case of other types of organisations, national, regional or local vocabularies should be used. |
| dct:spatial | Catalogue, Dataset | MDR Continents Named Authority List[[29]](#footnote-29), MDR Countries Named Authority List[[30]](#footnote-30), MDR Places Named Authority List[[31]](#footnote-31), Geonames | <http://publications.europa.eu/mdr/authority/country/>, <http://publications.europa.eu/mdr/authority/place/>,  <http://publications.europa.eu/mdr/authority/continent/>, <http://sws.geonames.org/> | The MDR Name Authority Lists must be used for continents, countries and places that are in those lists; if a particular location is not in one of the mentioned Named Authority Lists, Geonames URIs must be used. |
| adms:status | Catalogue Record | ADMS change type vocabulary | [http://purl.org/adms/changetype](http://purl.org/adms/status/)/ | :created, :updated, :deleted |
| adms:status | Distribution | ADMS status vocabulary | <http://purl.org/adms/status/> | The list of terms in the ADMS status vocabulary is included in the ADMS specification[[32]](#footnote-32) |
| dct:type | Agent | ADMS publisher type vocabulary | <http://purl.org/adms/publishertype/> | The list of terms in the ADMS publisher type vocabulary is included in the ADMS specification |
| dct:type | Licence Document | ADMS licence type vocabulary | <http://purl.org/adms/licencetype/> | The list of terms in the ADMS licence type vocabulary is included in the ADMS specification |

## Other controlled vocabularies

In addition to the proposed common vocabularies in section 5.2, which are mandatory to ensure minimal interoperability, implementers are encouraged to publish and to use further region or domain-specific vocabularies that are available online. 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[[33]](#footnote-33), the CERIF standard vocabularies[[34]](#footnote-34), the Dewey Decimal Classification[[35]](#footnote-35) and numerous other schemes.

## Licence vocabularies

Concerning licence vocabularies, implementers are encouraged to use widely recognised licences such as Creative Commons licences[[36]](#footnote-36), and in particular the CC Zero Public Domain Dedication[[37]](#footnote-37), the Open Data Commons Public Domain Dedication and License (PDDL)[[38]](#footnote-38), the ISA Open Metadata Licence[[39]](#footnote-39), the European Union Public Licence (EUPL)[[40]](#footnote-40) or an open government licence such as the UK Open Government Licence[[41]](#footnote-41).

Further activities in this area are undertaken by the Open Data Institute[[42]](#footnote-42) with the Open Data Rights Statement Vocabulary[[43]](#footnote-43) and by the Open Digital Rights Language (ODRL) Initiative[[44]](#footnote-44).

# Conformance Statement

## Provider requirements

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

* Provide a description of the Catalogue, including at least the mandatory properties specified in section 4.1.1.
* Provide information for the mandatory properties specified in section 4.2.1, if descriptions of Catalogue Records are provided – please note that the provision of descriptions of Catalogue Records is optional.
* Provide descriptions of Datasets in the Catalogue, including at least the mandatory properties specified in section 4.3.1.
* Provide descriptions of Distributions, if any, of Datasets in the Catalogue, including at least the mandatory properties specified in section 4.4.1.
* Provide descriptions of all organisations involved in the descriptions of Catalogue and Datasets, including at least the mandatory properties specified in section 4.5.1.
* Provide descriptions of all category schemes that contain the categories that are asserted in any of the descriptions of Datasets in the Catalogue, including at least the mandatory properties specified in section 4.6.1.
* Provide descriptions of all categories involved in the descriptions of Datasets in the Catalogue, including at least the mandatory properties specified in section 4.7.1.

For the properties listed in the table in section 5, the associated controlled vocabularies must be used. Additional controlled vocabularies may be used.

In addition to the mandatory properties, any of the recommended and optional properties defined in section 4 may be provided.

Recommended and optional classes may have mandatory properties, but those only apply if and when an instance of such a class is present in a description.

## 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 3.
* Process information for all properties specified in section 4.
* Process information for all controlled vocabularies specified in section 5.2.

As stated in section 3, "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.).

# Agent roles

The DCAT Application Profile specified in this document has a single property to relate an Agent (typically, an organisation) to a Dataset. The only such ‘agent role’ that can be expressed in the current version of the profile is through the property dct:publisher (<http://purl.org/dc/terms/publisher>), defined as “An entity responsible for making the dataset available”. A second property is available in the DCAT recommendation, dcat:contactPoint (<http://www.w3.org/TR/vocab-dcat/#Property:dataset_contactPoint>), defined as “Link a dataset to relevant contact information which is provided using VCard”, but this is not an agent role as the value of this property is contact data, rather than a representation of the organisation as such.

In specific cases, for example in exchanging data among domain-specific portals, it may be useful to express other, more specific agent roles. In such cases, extensions to the base profile may be defined using additional properties with more specific meanings.

Two possible approaches have been discussed, particular in the context of the development of the domain-specific GeoDCAT Application Profile, an extension of the base DCAT Application Profile.

The first possible approach is based on the use of a predicate vocabulary that provides a set of properties that represent additional types of relationships between Datasets and Agents. For example, properties could be defined, such as foo:owner, foo:curator or foo:responsibleParty, in addition to the use of existing well-known properties, such as dct:creator and dct:rightsHolder. A possible source for such additional properties is the Roles Named Authority List[[45]](#footnote-45) maintained by the Publications Office of the EU. Other domain-specific sources for additional properties are the INSPIRE Responsible Party roles[[46]](#footnote-46), the Library of Congress’ MARC relators[[47]](#footnote-47) and DataCite’s contributor types[[48]](#footnote-48). To enable the use of such properties, they must be defined as RDF properties with URIs in a well-managed namespace.

A second approach is based on the use of W3C’s PROV ontology[[49]](#footnote-49) which provides a powerful mechanism to express a set of classes, properties, and restrictions that can be used to represent and interchange provenance information generated in different systems and under different contexts. In the context of work on GeoDCAT-AP, a PROV-conformant solution for expressing agent roles was agreed[[50]](#footnote-50). This solution uses prov:qualifiedAttribution in combination with a dct:type assertion pointing to the code list for Responsible Party Role in the INSPIRE registry. To enable the use of such types, they must be defined with URIs in a well-managed namespace.

Based on the experience gained with the use of domain-specific extensions for additional ‘agent roles’ in the exchange of information about Datasets, the base DCAT Application Profile may in the future be extended with additional roles that have proven to be useful across domains.

It should be noted that, even if a more expressive approach is used in a particular implementation, the provision of information using dct:publisher for the Catalogue is still mandatory under the rules laid down in the Conformance Statement in section 6, while the provision of information using dct:publisher is strongly recommended for Dataset. The provision of such information using dct:publisher will ensure interoperability with implementations that use the basic approach of DCAT-AP.

# Accessibility and Multilingual Aspects

**Accessibility** in the context of this Application Profile is limited to information about the technical format of distributions of datasets. The properties dcat:mediaType and dct:format provide information that can be used to determine what software can be deployed to process the data. The accessibility of the data within the datasets needs to be taken care of by the software that processes the data and is outside of the scope of this Application Profile.

**Multilingual aspects** related to this Application Profile concern all properties whose contents are expressed as strings (i.e. rdfs:Literal) with human-readable text. Wherever such properties are used, the string values are of one of two types:

* The string is free text. Examples are descriptions and labels. Such text may be translated into several languages.
* The string is an appellation of a ‘named entity’. Examples are names of organisations or persons. These names may have parallel versions in other languages but those versions don’t need to be literal translations.

Wherever values of properties are expressed with either type of string, the property can be repeated with translations in the case of free text and with parallel versions in case of named entities. For free text, e.g. in the cases of titles, descriptions and keywords, the **language tag** is mandatory.

Language tags to be used with [rdfs:Literal](http://www.w3.org/TR/rdf11-concepts/#section-Graph-Literal) are defined by [BCP47](http://tools.ietf.org/html/bcp47)[[51]](#footnote-51), which allows the use of the "t" extension for text transformations defined in [RFC6497](http://tools.ietf.org/html/rfc6497)[[52]](#footnote-52) with the field ["t0"](http://unicode.org/cldr/trac/browser/trunk/common/bcp47/transform_mt.xml)[[53]](#footnote-53) indicating a machine translation.

A language tag will look like: "en-t-es-t0-abcd", which conveys the information that the string is in English, translated from Spanish by machine translation using a tool named "abcd".

For named entities, the language tag is optional and should only be provided if the parallel version of the name is strictly associated with a particular language. For example, the name ‘European Union’ has parallel versions in all official languages of the union, while a name like ‘W3C’ is not associated with a particular language and has no parallel versions.

For linking to different language versions of associated web pages (e.g. landing pages) or documentation, a content negotiation[[54]](#footnote-54) mechanism may be used whereby different content is served based on the Accept-Languages indicated by the browser. Using such a mechanism, the link to the page or document can resolve to different language versions of the page or document.

All the occurrences of the property dct:language, which can be repeated if the metadata is provided in multiple languages, must have a URI as their object, not a literal string from the ISO 639 code list.

How multilingual information is handled in systems, for example in indexing and user interfaces, is outside of the scope of this Application Profile.

# Acknowledgements

This work was elaborated by a Working Group under the ISA programme. The Working Group was chaired by **Norbert Hohn** and **Willem Van Gemert** from the Publications Office. The ISA Programme of the European Commission was represented by **Vassilios Peristeras** and **Athanasios Karalopoulos**. **Makx Dekkers** was the editor of the specification.

The members of the Working Group:

|  |  |
| --- | --- |
| Name | Organisation |
| Øystein Åsnes | DIFI, Norway |
| Leda Bargiotti | PwC EU Services |
| Peter Biro |  |
| Valérie Brasse | IS4RI, France |
| Georges Charlot | Centre d’Informatique pour la Région Bruxelloise (CIRB), Belgium |
| Pieter Colpaert | MultiMedia Lab, Ghent University, iMinds, Belgium |
| Marco Combetto | Informatica Trentina, Italy |
| Alex D. | Sciamlab, Italy |
| Michiel de Keyzer | PwC EU Services |
| Makx Dekkers | AMI Consult, EU |
| Anastasia Dimou | University of Ghent |
| Benjamin Dittwald | Fraunhofer FOKUS, Germany |
| Martin Dürst | W3C |
| Simon Dutkowski | Fraunhofer FOKUS, Germany |
| Jan Dvorak |  |
| Udo Einspanier | con terra, Germany |
| Enrico Francesconi | ITTIG-CNR, Italy |
| Emilio García | Ministerio de Hacienda y Administraciones Públicas, Spain |
| Stijn Goedertier | PricewaterhouseCoopers, Belgium |
| Christopher Gutteridge | University of Southampton, UK |
| Bert Hanssens | Fedict, Belgium |
| Pascal Heus | Integrated Data Management Services and Metadata Technology North America, USA |
| Norbert Hohn | Publications Office of the European Union, Luxembourg |
| Antonio Ibáñez Pascual | Junta de Castilla y Léon, Spain |
| Carlos Iglesias | Spain |
| Athanasios Karalopoulos | European Commission |
| Dominik Klauser | Bundeskanzleramt, Austria |
| Stefanos Kotoglou | PwC EU Services |
| Javier Lacasta Miguel | University of Zaragoza |
| Deirdre Lee | Derilinx, Ireland |
| Nikolaos Loutas | PwC EU Services |
| Carlo Marchetti | Senato della Repubblica, Italy |
| Florian Marienfeld | Fraunhofer FOKUS, Germany |
| Andrea Maurino | University of Milano–Bicocca, Italy |
| Michael Ostling | MetaGIS, Sweden |
| Hans Overbeek | KOOP Kennis- en Exploitatiecentrum Officiële Overheidspublicaties, Netherlands |
| Theodoros Papadopoulos | Ministry of Administrative Reform and E-Governance, Greece |
| José Pastor Camarasa | Publications Office of the European Union, Luxembourg |
| Andrea Perego | Joint Research Centre (JRC) |
| Vassilios Peristeras | European Commission |
| Hannes Reuter | EUROSTAT, Luxembourg |
| Pascal Romain | Conseil général de la Gironde, France |
| Antonio Rotundo | Agenzia per l'Italia Digitale (AgID), Italy |
| Martin Seiler | Bundesamt für Kartographie und Geodäsie, Germany |
| Enric Staromiejski | Everis, Belgium |
| Angelos Tzotsos | National Technical University of Athens, Greece |
| Jorgen Van Den Langenbergh | PwC EU Services |
| Willem Van Gemert | Publications Office of the European Union, Luxembourg |
| Bert Van Nuffelen | TenForce, Belgium |
| Brecht Wyns | PwC EU Services |
| Agnieszka Zajac | Publications Office of the European Union, Luxembourg |

# Annex I. Quick reference of classes and properties

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Class | Class URI | Mandatory prop. | Recommended prop. | Optional properties |
| Agent | foaf:Agent | foaf:name | dct:type |  |
| Category | skos:Concept | skos:prefLabel |  |  |
| Category Scheme | skos:ConceptScheme | dct:title |  |  |
| Catalogue | dcat:Catalog | dcat:dataset  dct:description  dct:publisher  dct:title | foaf:homepage  dct:language  dct:license  dct:issued  dcat:themeTaxonomy  dct:modified | dct:hasPart  dct:isPartOf  dcat:record  dct:rights  dct:spatial |
| Catalogue Record | dcat:CatalogRecord | dct:modified  foaf:primaryTopic | dct:conformsTo  adms:status  dct:issued | dct:description  dct:language  dct:source  dct:title |
| Checksum | spdx:Checksum | spdx:algorithm  spdx:checksumValue |  |  |
| Dataset | dcat:Dataset | dct:description  dct:title | dcat:contactPoint  dcat:distribution  dcat:keyword  dct:publisher  dcat:theme | adms:identifier  adms:sample  adms:versionNotes  dcat:landingPage  dct:accessRights  dct:accrualPeriodicity  dct:conformsTo  dct:hasVersion  dct:isVersionOf  dct:identifier  dct:issued  dct:language  dct:modified  dct:provenance  dct:relation  dct:source  dct:spatial  dct:temporal  dct:type  foaf:page  owl:versionInfo |
| Distribution | dcat:Distribution | dcat:accessURL | dct:description  dct:format  dct:license | adms:status  dcat:byteSize  dcat:downloadURL  dcat:mediaType  dct:conformsTo  dct:issued  dct:language  dct:modified  dct:rights  dct:title  foaf:page  spdx:checksum |
| Document | foaf:Document |  |  |  |
| Frequency | dct:Frequency |  |  |  |
| Identifier | adms:Identifier | skos:notation |  |  |
| Kind | vcard:Kind |  |  |  |
| Licence Document | dct:LicenseDocument | dct:type |  |  |
| Licence Type | skos:Concept |  |  |  |
| Linguistic System | dct:LinguisticSystem |  |  |  |
| Literal | rdfs:Literal |  |  |  |
| Location | dct:Location |  |  |  |
| Media Type or Extent | dct:MediaTypeOrExtent |  |  |  |
| Period Of Time | dct:PeriodOfTime |  |  | schema:startDate  schema:endDate |
| Publisher Type | skos:Concept |  |  |  |
| Resource | rdfs:Resource |  |  |  |
| Rights Statement | dct:RightsStatement |  |  |  |
| Standard | dct:Standard |  |  |  |
| Status | skos:Concept |  |  |  |

# Annex II. Dataset Theme vocabulary

The following terms have been proposed in a new vocabulary for use in dcat:theme. URIs for the vocabulary and the terms in it are being defined at the Publications Office of the European Union.

The EU Data Themes Vocabulary will be available at the URI [http://publications.europa.eu/resource/authority/data-theme](http://publications.europa.eu/resource/authority/eu-data-theme), and contains the following terms:

|  |  |  |  |
| --- | --- | --- | --- |
| Nr. | Concept | Code | URI |
| 1 | Agriculture, fisheries, forestry and food | AGRI | http://publications.europa.eu/resource/authority/data-theme/AGRI |
| 2 | Education, culture and sport | EDUC | http://publications.europa.eu/resource/authority/data-theme/EDUC |
| 3 | Environment | ENVI | http://publications.europa.eu/resource/authority/data-theme/ENVI |
| 4 | Energy | ENER | http://publications.europa.eu/resource/authority/data-theme/ENER |
| 5 | Transport | TRAN | http://publications.europa.eu/resource/authority/data-theme/TRAN |
| 6 | Science and technology | TECH | http://publications.europa.eu/resource/authority/data-theme/TECH |
| 7 | Economy and finance | ECON | http://publications.europa.eu/resource/authority/data-theme/ECON |
| 8 | Population and social conditions | SOCI | http://publications.europa.eu/resource/authority/data-theme/SOCI |
| 9 | Health | HEAL | http://publications.europa.eu/resource/authority/data-theme/HEAL |
| 10 | Government and public sector | GOVE | http://publications.europa.eu/resource/authority/data-theme/GOVE |
| 11 | Regions and cities | REGI | http://publications.europa.eu/resource/authority/data-theme/REGI |
| 12 | Justice, legal system and public safety | JUST | http://publications.europa.eu/resource/authority/data-theme/JUST |
| 13 | International issues | INTR | http://publications.europa.eu/resource/authority/data-theme/INTR |

# Annex III Change Log

The table below summarises the changes applied to the current release of the DCAT-AP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| URI | Type | Action | Description | Issue |
| adms:versionNotes | Optional property (Dataset) | Updated | *Updates*  Cardinality: 0..1 → 0..n  This property can be repeated for parallel language versions of the version notes. | [CO4](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/co4-replace-admsversion-owlversioninfo) |
| dcat:contactPoint | Recommended property  (Dataset) | Updated | *Updates*  URI: adms:contactPoint → dcat:contactPoint  Range: VCard → vCard:Kind | [MO8](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/mo8-abandon-use-vcard-contact-point) |
|  |  |  |  |  |
| dct:LicenseDocument | Recommended  class | Updated | *Updates*  Optional class → recommended class | [OB4](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/ob4-make-dctlicensedocument-recommended) |
| dct:Location | Optional class | Updated | Added reference to GeoDCAT-AP for expression of co-ordinates | [IM4](https://joinup.ec.europa.eu/node/138937) |
| dct:source | Optional property (CatalogRecord) | New | Range: dcat:CatalogRecord  This property links to the original metadata that was used in creating metadata for the Dataset | [MO5](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/mo5-add-class-originalmetadatarecord-and-specify-property-refer) |
| owl:versionInfo | Optional property (Dataset) | Updated | *Updates*  URI: adms:version → owl:versionInfo | [CO4](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/co4-replace-admsversion-owlversioninfo) |
| spdx:algorithm | Mandatory property (Checksum) | New | Range: spdx:checksumAlgorithm\_sha1  Cardinality: 1..1  This property identifies the algorithm used to produce the subject Checksum. Currently, SHA-1 is the only supported algorithm. It is anticipated that other algorithms will be supported at a later time. | [PR1](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr1-add-new-property-distribution-enable-verificationof-integri) |
| spdx:Checksum | Optional class | New | A value that allows the contents of a file to be authenticated. This class allows the results of a variety of checksum and cryptographic message digest algorithms to be represented. | [PR1](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr1-add-new-property-distribution-enable-verificationof-integri) |
| spdx:checksum | Optional property (Dataset) | New | Range: spdx:Checksum  Cardinality: 0..1  This property provides a mechanism that can be used to verify that the contents of a Distribution have not changed | [PR1](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr1-add-new-property-distribution-enable-verificationof-integri) |
| spdx:checksumValue | Mandatory property (Checksum) | New | Range: rdfs:Literal typed as xsd:hexBinary  Cardinality: 1..1  This property provides a lower case hexadecimal encoded digest value produced using a specific algorithm. | [PR1](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr1-add-new-property-distribution-enable-verificationof-integri) |
| vCard:Kind | Optional class | Updated | *Updates*  Class name: VCard → Kind  URI: VCard → vcard:Kind  The class Kind is the parent class for the four explicit types of vCards (Individual, Organization, Location, Group). | [MO4](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/mo4-add-new-class-extension-without-specific-semantics) |
| dct:language | Optional property (Catalogue Record) | New | This property refers to a language used in the textual metadata describing titles, descriptions, etc. of the Datasets in the Catalogue. This property can be repeated if the metadata is provided in multiple languages. | [PR28](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr28-indicate-language-original-metadata) |
| dct:provenance | Optional property (Dataset) | New | Range: dct:ProvenanceStatement  This property contains a statement about the lineage of a Dataset. | [PR6](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr6-add-new-property-dataset-refer-authority-responsible-making), [PR13](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr13-add-new-property-dataset-refer-other-datasets-were-used-in), [PR14](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr14-add-new-property-express-lineage), [MO5](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/mo5-add-class-originalmetadatarecord-and-specify-property-refer) |
| dct:source | Optional property (Dataset) | New | Range: dcat:Dataset  This property refers to a related Dataset from which the described Dataset is derived. | [PR6](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr6-add-new-property-dataset-refer-authority-responsible-making), [PR13](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr13-add-new-property-dataset-refer-other-datasets-were-used-in), [PR14](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr14-add-new-property-express-lineage), [MO5](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/mo5-add-class-originalmetadatarecord-and-specify-property-refer) |
| dct:accessRights | Optional property (Dataset) | New | Range: dct:RightsStatement  This property refers to information that indicates whether the Dataset is open data, has access restrictions or is not public. | [PR2](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr2-add-new-property-dataset-indicate-whether-dataset-public-re), [PR3](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr3-add-new-property-dataset-indicate-why-dataset-restricted-or) |
| dct:hasVersion | Optional property (Dataset) | New | Range: dcat:Dataset  This property refers to a related Dataset that is a version, edition, or adaptation of the described Dataset. | [PR5](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr5-add-new-property-relate-datasets-time-series), [PR16](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr16-use-dctisversionof-link-versions-datasets-together), [MO12](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/mo12-grouping-datasets) |
| dct:isVersionOf | Optional property (Dataset) | New | Range: dcat:Dataset  This property refers to a related Dataset of which the described Dataset is a version, edition, or adaptation. | [PR5](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr5-add-new-property-relate-datasets-time-series), [PR16](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr16-use-dctisversionof-link-versions-datasets-together), [MO12](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/mo12-grouping-datasets) |
| dct:relation | Optional property (Dataset) | New | Range: rdfs:Resource  This property refers to a related resource. | [PR19](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr19-add-new-property-dataset-refer-related-resources), [MO12](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/mo12-grouping-datasets) |
| foaf:page | Optional property (Dataset) | New | Range: foaf:Document  This property refers to a page or document about this Dataset. | [PR19](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr19-add-new-property-dataset-refer-related-resources), [PR26](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr26-add-property-dctrelation-distribution-point-related-resour) |
| dcat:mediaType | Controlled vocabulary | Modified | Modifications:  MDR list → IANA types | [PR22](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr22-remove-dcatmediatype-and-only-use-dctformat), [VO3](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/vo3-propose-uri-set-be-used-property-format) |
| dct:spatial | Controlled vocabulary | Modified | Modifications:  Added recommendation to use sws.geonames.org if the needed place is not listed in the MDR | [VO9](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/vo9-add-necessary-place-mdr-places-nal-and/or-identify-and-reco) |
| dct:isPartOf | Optional Property (Catalogue) | New | Range: dcat:Catalog  This property refers to a related Catalogue in which the described Catalogue is physically or logically included. | [nesting](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/nesting-part-relationships-catalog-and-dataset) |
| adms:sample | Optional property (Dataset) | New | This property is related to sample(s) of the dataset | [PR21](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/pr21-add-new-property-distribution-refer-sample-data) |
| foaf:page | Optional Property (Distribution) | New | A page or document about this Distribution | [M02](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/mo2-integrate-parts-void-particular-voiddatasetdescription-and-) |
| dct:hasPart | Optional Property (Catalogue) | New | Range: dcat:Catalog  This property refers to a related Catalogue that is part of the described Catalogue | [nesting](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/nesting-part-relationships-catalog-and-dataset) |
| dcat:themeTaxonomy | Controlled vocabulary | Modified | Modification  Changed the recommendation to use new 13-term vocabulary proposed by the Publications Office instead of EuroVoc. Added clarification that value is the URI of the concept scheme, not of the concepts | [VO2](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/vo2-create-new-list-concepts-property-theme) |
| dcat:theme | Controlled vocabulary | Modified | Modifications:  Changed the recommendation to use terms from the new 13-term vocabulary proposed by the Publications Office instead of EuroVoc domains.  URI: dct:theme -> dcat:theme | [VO2](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/vo2-create-new-list-concepts-property-theme) |
| dct:type | Optional Property (Dataset) | New | This property refers to a type of the Dataset |  |
| dct:conformsTo | Recommended Property (Catalogue Record) | New | This property refers to an Application Profile that the Dataset’s metadata conforms to |  |
| dct:accrualPeriodicity | Controlled vocabulary | Modified | Modification  Changed the recommendation to use terms from the Frequency Name Authority List maintained by the Publications Office instead of the Dublin Core Collection Description Frequency Vocabulary |  |
| dcat:landingPage | Optional property (Dataset) | Updated | *Updates*  Cardinality: 0..1 → 0..n | [Issue](https://joinup.ec.europa.eu/asset/dcat_application_profile/issue/drop-maximum-cardinality-constraint-dcatlandingpage) link |

Further textual changes:

* Removed sections on related work, use cases and deployment issues.
* Updated references to DCAT to refer to the W3C Recommendation of 14 January 2014.
* Added section 7 on Agent roles.
* Added explanation on how to express that text was machine-translated using RFC6497 in section 8.
* Updated the membership list in section 9.
* Updated the quick reference in Annex I.
* Added URIs to Annex II.

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