DCAT Application Profile for EU Open Data Portal

Version 1.03 - 2017

Date: 2017-06-06

Document Metadata

Property	Value
Date	2017-06-21
Status	Final
Version	1.03
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Access URL	This specification can be downloaded from the Open Data Portal web site: http://data.europa.eu/euodp

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1 INTRODUCTION

1.1 Context

This objective of this work is to define an Application Profile that can be used for the exchange of descriptions of datasets in the Open Data Portal of the EU Publications Office.

This application profile is based on the DCAT-AP V1.1, application profile prepared for the ISA Programme.

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.

The work does not cover implementation issues like mechanisms for edit or publish controlled vocabularies and expected behaviour of systems implementing the Application Profile other than what is defined in the Conformance Statement.

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

1.2 Context of use

The basic use cases involve the following actors and systems:

- the data providers who must provide descriptions of the datasets based on this application profile,

- the EU Open Data Portal team who must control the description of the datasets received from the providers,

- a technical environment which must be able to manage the dataset descriptions as records in a catalogue management system.

The DCAT-AP-OP application profile described in this document is based on DCAT-AP V1.1, however various changes have been introduced:

- Additional properties have been used to answer specific needs,

- Controlled vocabularies have been selected for all the properties with controlled values.

This document is aligned with the Ontology Web Language (OWL) DCAT-AP-OP ontology. Created to provide the standard data model for profile definition.

1.3 The DCAT specification

The specification of the Data Catalog Vocabulary (DCAT) was published by W3C as a W3C Recommendation on 16 January 2014[1].

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

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[1] W3C. Data Catalog Vocabulary (DCAT). W3C Recommendation 16 January 2014. http://www.w3.org/TR/2014/REC-vocab-dcat-20140116/

2 TERMINOLOGY USED IN THE DCAT APPLICATION PROFILE FOR EU OPEN DATA PORTAL

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.

- **Mandatory property**: a receiver MUST be able to process the information for that property; a sender MUST provide the information for that property.

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[2].

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 4 if they appear as the range of one of the mandatory properties in section 5.

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#

- cnt : http://www.w3.org/2011/content#

- dcat: http://www.w3.org/ns/dcat#

- dcatapop: http://data.europa.eu/88u/ontology/dcatapop

- dct: http://purl.org/dc/terms/

- foaf: http://xmlns.com/foaf/0.1/

- gsp: http://www.opengis.net/ont/geosparql#

- locn: http://www.w3.org/ns/locn#

- owl: http://www.w3.org/2002/07/owl#

- prov: http://www.w3.org/ns/prov#

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[2] IETF. RFC 2119. Key words for use in RFCs to Indicate Requirement Levels. http://www.ietf.org/rfc/rfc2119.txt

- 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#
- xsd: http://www.w3.org/2001/XMLSchema#
- vcard: http://www.w3.org/2006/vcard/ns#

3 NOTES AND REMARKS ABOUT EU OPEN DATA PORTAL APPLICATION PROFILE

DCAT application profile suited for EU Open Data Portal business needs is based on:

- dcat-ap version 1.1

- Extension from various standard, open ontologies

- A specific ontology, dcat-ap-op, which was created to define a class and few properties which were not defined in standard ontologies (http://data.europa.eu/88u/ontology/dcat-ap-op).

3.1 DCAT-AP-OP ontology

DCAT-AP-OP ontology defines the following class and properties:

Class	URI	Usage note
Data extension	dcatapop:DataExtension	A class used to store extra metadata about the dataset which cannot be expressed with the standard data model

Property	URI	Range	Usage note	Card.
Number of views	dcatapop:numberOfViews	rdfs:Integer	This property indicates how many time the dataset has been viewed in the Open Data Portal	0..1
extension for literal	dcatapop:extensionLiteral	dcatapop:DataExtension	The property allows to add a literal metadata to describe the Dataset. The purpose of this mechanism is to allow flexibility to the application profile and answer specific business related needs.	0..n
extension for value	dcatapop:extensionValue	dcatapop:DataExtension	The property allows to add a value metadata to describe the Dataset. The purpose of this mechanism is to allow flexibility to the application profile and answer specific business related needs.	0..n
is part of catalog	dcatapop:isPartOfCatalog	dcat:Catalog	This property indicates to which catalog the dataset belongs (inverse property of dcat:catalog)	0..1
related application	dcatapop:applicationUsingDataset	xsd:anyURI	This property indicates the URL of applications using the Dataset.	0..n
temporal granularity	dcatapop:temporalGranularity	skos:Concept	This property indicates the time granularity of the statistical observations in the dataset The values are concepts of MDR Time Period vocabulary	0..1
ckan-name	dcatapop:ckanName	rdfs:Literal	unique name which is either nice-name and is based on the title, or it is a hash if there is no nice name. This name is used to create a URL of the record.	1...1
access url translation of resource	dcatapop:accessUrlTranslation	rdfs:Resource	This property contains a URL that gives access to translations of the Distribution of the Dataset.	0..n
iframe	dcatapop:iframe	rdfs:Integer	Embed code to give access to visualisation of the dataset. Only used for Distribution of type "visualization".	0..1

Property	URI	Range	Usage note	Card.
number of downloads	dcatpop:numberOfDownloads	rdfs:Integer	This property indicates the number of time the distribution has been downloaded.	0..1
Text extension	dcatapop:dataExtensionLiteral	rdfs:Literal	Property to store a text value	0..n
Numeric extension	dcatapop:dataExtensionValue	xsd:integer	Property to store a numeric value	0..n

ULM schema of dcat-ap-op

3.2   Extensions of DCAT-AP: what for?

DCAT-AP has been extended to DCAT-AP-OP to answer specific business needs. We will focus on some of them bellow.

3.2.1   Distribution to access visualisation

The access to visualisation of the data is described as an instance of the class Distribution, with a specific property to indicate the access to visualisation tool (dcatapop:iframe).

3.2.2   Describe documentation

Property are added to the class Document to describe with more accuracy the documentation of the dataset.

3.2.3   Add ad-hoc metadata

A class DataExtension and few properties are added to be able to add ad-hoc metadata to describe dataset.

3.2.4   Cover various business needs

Several properties are added to Dataset and Distribution to answer various specific needs.

3.3   Support for GEO DCAT extension

GEO DCAT extension is supported by EU Open Data Portal, and thus the extension has been described in this document.

3.4   Support for DCAT-AP Stat extension

DCAT-STAT extension is supported by EU Open Data Portal, and thus the extension has been described in this document.

4 APPLICATION PROFILE CLASSES INCLUDING CLASSES FOR GEODCAT-AP AND DCAT-STAT-AP

Class name	M/O	Usage note for the Application Profile	URI	Reference
Agent	O	An entity that is associated with Catalogues and/or Datasets. If the Agent is an organisation, the use of the Organization Ontology[3] 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/
Catalogue	O	A catalogue or repository that hosts the Datasets being described.	dcat:Catalog	http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-catalog
Catalogue Record	M	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
Category	O	A subject of a Dataset.	skos:Concept	http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-category-and-category-scheme
Category scheme	O	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
Checksum	M	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
Data extension	M	A class used to store extra metadata about the dataset which cannot be expressed with the standard data model	dcatapop:DataExtension	http://data.europa.eu/88u/ontology/dcatapop#DataExtension
Dataset	O	A conceptual entity that represents the information published.	dcat:Dataset	http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-dataset
Distribution	M	A physical embodiment of the Dataset in a particular format.	dcat:Distribution	http://www.w3.org/TR/2013/WD-vocab-dcat-20130312/#class-distribution
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	M	A rate at which something recurs, e.g. the publication of a Dataset.	dct:Frequency	http://dublincore.org/documents/dcmi-terms/#terms-Frequency
Identifier	M	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

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[3] W3C. The Organization Ontology. W3C Candidate Recommendation, 25 June 2013. http://www.w3.org/TR/2013/CR-vocab-org-20130625/

Class name	M/O	Usage note for the Application Profile	URI	Reference
Kind	M	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
Licence document	M	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
Linguistic system	M	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
Literal	O	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[4].	rdfs:Literal	http://www.w3.org/TR/rdf-concepts/#section-Literals
Location	M	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[5] 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	M	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	M	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
Provenance Statement	M	A statement of any changes in ownership and custody of a resource since its creation that are significant for its authenticity, integrity, and interpretation	dct:ProvenanceStatement	http://dublincore.org/documents/dcmi-terms/#terms-ProvenanceStatement
Publisher type	M	A type of organisation that acts as a publisher	skos:Concept	http://www.w3.org/TR/vocab-adms/#dcterms-type
Resource	O	Anything described by RDF.	rdfs:Resource	http://www.w3.org/TR/rdf-schema/#ch_resource
Rights statement	M	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	M	A standard or other specification to which a Dataset or Distribution conforms	dct:Standard	http://dublincore.org/documents/dcmi-terms/#terms-Standard
Status	M	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

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[4] IETF. BCP 47. Tags for Identifying Languages. http://www.rfc-editor.org/rfc/bcp/bcp47.txt
[5] European Commission. Joinup. Core Location Vocabulary. https://joinup.ec.europa.eu/asset/core_location/description

5   DCAT APPLICATION PROFILE PROPERTIES PER CLASS

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

5.1   Catalogue

5.1.1   Properties defined by dcat-ap

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
has part	dct:hasPart	dcat:Catalog	This property refers to a related Catalogue that is part of the described Catalogue	0..n
homepage	foaf:homepage	foaf:Document	This property refers to a web page that acts as the main page for the Catalogue.	0..1
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
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. The values are concepts of MDR Language table	0..n
licence	dct:license	dct:LicenseDocument	This property refers to the licence under which the Catalogue can be used or reused.	0..1
publisher	dct:publisher	foaf:Agent	This property refers to an entity (organisation) responsible for making the Catalogue available. The values are concepts of MDR Language table	1..1
record	dcat:record	dcat:CatalogRecord	This property refers to a Catalogue Record that is part of the Catalogue	0..n
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
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
themes	dcat:themeTaxonomy	skos:ConceptScheme	This property refers to a knowledge organization system used to classify the Catalogue's Datasets. The values are concepts of MDR Data theme	0..n

Property	URI	Range	Usage note	Card.
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
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

5.1.2 Properties defined by geodcat-ap_v1.0.1

Property	URI	Range	Usage note	Card.
description	dct:created	rdfs:Literal typed as xsd:date or xsd:dateTime	This property indicates the initial date of creation of the dataset.	0..1

5.2 Catalogue Record

5.2.1 Properties defined by dcat-ap

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. The values are concepts of ADMS change type vocabulary; created, updated, deleted	0..1
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
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
primary topic	foaf:primaryTopic	dcat:Dataset	This property links the Catalogue Record to the Dataset described in the record.	1..1
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
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

5.2.2   Properties defined by dcat application profile for EU Publications Office

Property	URI	Range	Usage note	Card.
Number of views	dcatapop:numberOfViews	rdfs:Integer	This property indicates how many time the dataset has been viewed in the Open Data Portal	0..1

5.2.3   Properties defined by geodcat-ap

Property	URI	Range	Usage note	Card.
Metadata caracter set	cnt:caracterEncoding	rdfs:Literal	This property indicate the encoding of the metadata.	0..1

5.3   Dataset

5.3.1   Properties defined by dcat-ap

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
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
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
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
keyword/ tag	dcat:keyword	rdfs:Literal	This property contains a keyword or tag describing the Dataset.	0..n

Property	URI	Range	Usage note	Card
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[6], DataCite[7], DOI[8], EZID[9] or W3ID[10].	0..n
provenance	dct:provenance	dct:ProvenanceStatement	This property contains a statement about the lineage of a Dataset.	0..n
publisher	dct:publisher	foaf:Agent	This property refers to an entity (organisation) responsible for making the Dataset available.	0..1
related resource	dct:relation	rdfs:Resource	This property refers to a related resource.	0..n
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 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
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. The values are concepts of MDR Dataset theme	0..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

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[6] Mikulski Archive for Space Telescopes (MAST). Referencing Data Sets in Astronomical Literature. http://archive.stsci.edu/pub_dsn.html

[7] DataCite. http://www.datacite.org/

[8] DOI. Digital Object Identifier. http://www.doi.org/

[9] EZID. http://n2t.net/ezid

W3C Permanent Identifier Community Group. Permanent Identifiers for the Web.

Property	URI	Range	Usage note	Card
type	dct:type	skos:Concept	This property refers to the type of the Dataset. The values are concepts of MDR Dataset type	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

5.3.2 Properties defined by dcat application profile for EU Publications Office

Property	URI	Range	Usage note	Card dcat-ap-op
alternative title	dct:alternative	rdfs:Literal	Alternative name of the dataset	0..n
ckan-name	dcatapop:ckanName	rdfs:Literal	unique name which is either nice-name and is based on the title, or it is a hash if there is no nice name. This name is used to create a URL of the record.	1...1
controlled keyword	dct:subject	skos:Concept	The property allows to indicate the subject of the dataset. The values are concepts of EuroVoc concepts, other domain specific vocabularies like GEMET.	0..n
creator	dct:creator	foaf:Agent	An entity, such as a person, organisation, or service, that is responsible for making contributions to the dataset. Values are concepts of MDR Corporate Bodies Named Authority List	0..1
Dataset group	dcatapop:datasetGroup	skos:Concept	This property allows to classify Datasets with a controlled vocabulary managed by ODP The values are concepts of ODP Groups Vocabulary	0..n
extension for literal	dcatapop:extensionLiteral	dcatapop:DataExtension	The property allows to add a literal metadata to describe the Dataset. The purpose of this mechanism is to allow flexibility to the application profile and answer specific business related needs.	0..n
extension for value	dcatapop:extensionValue	dcatapop:DataExtension	The property allows to add a value metadata to describe the Dataset. The purpose of this mechanism is to allow flexibility to the application profile and answer specific business related needs.	0..n

has Part	dct:hasPart	dcat:Dataset	The described dataset has other datasets has parts.	0..n
is Part of	dct:isPartOf	dcat:Dataset	The described dataset is part of another dataset.	0..n
is part of catalog	dcatapop:isPartOfCatalog	dcat:Catalog	This property indicates to which catalog the dataset belongs (inverse property of dcat:catalog)	0..1
related application	dcatapop:applicationUsingDataset	xsd:anyURI	This property indicates the URL of applications using the Dataset.	0..n
temporal granularity	dcatapop:temporalGranularity	skos:Concept	This property indicates the time granularity of the statistical observations in the dataset The values are concepts of MDR Time Period vocabulary	0..1

5.3.3 Additional optional properties for Dataset from stat-dcat-ap

Property	URI	Range	Usage note	Card stat dcat ap
attribute	stat:attribute	qb:AttributeProperty	This property links to a component used to qualify and interpret observed values, e.g. units of measure, any scaling factors and metadata such as the status of the observation (e.g. estimated, provisional). Attribute is a 'conceptual' entity that applies to all distribution formats, e.g. in case a dataset is provided both in SDMX and in Data Cube.	0..n
dimension	stat:dimension	qb:DimensionProperty	This property links to a component that identifies observations, e.g. the time to which the observation applies, or a geographic region which the observation covers. Dimension is a 'conceptual' entity that applies to all distribution formats, e.g. in case a dataset is provided both in SDMX and in Data Cube.	0..n
number of data series	stat:numSeries	rdfs:Literal typed as xsd:integer	This property contains the number of data series contained in the Dataset	
quality annotation	dqv:hasQualityAnnotation	oa:Annotation	This property links to a statement related to quality of the Dataset, including rating, quality certificate, feedback that can be associated to the Dataset.	0..n
unit of measurement	stat:statUnitMeasure	skos:Concept	This property links to a unit of measurement of the observations in the dataset, for example Euro, square kilometre, purchasing power standard (PPS), full-time equivalent, percentage. Unit of measurement is a 'conceptual' entity that applies to all distribution formats, e.g. in the case when a dataset is provided both in SDMX and in Data Cube.	0..n

5.3.4 Properties defined by geodcat-ap

Property	URI	Range	Usage note	Card. Geo dcat
Metadata caracter set	cnt:caracterEncoding	rdfs:Literal	This property indicate the encoding of the metadata.	0..1

5.4 Distribution

5.4.1 Properties defined by dcat-ap

Property	URI	Range	Usage note	Card. dcata pop
Property	**URI**	**Range**	**Usage note**	**Card dcata pop**
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
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
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
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
format	dct:format	dct:MediaTypeOrExtent	This property refers to the file format of the Distribution. The values are concepts of MDR File type	0..1
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. The values are concepts of MDR Language Named Authority List	0..n
licence	dct:license	dct:LicenseDocument	This property refers to the licence under which the Distribution is made available. The values are concepts of MDR Licence table, if the licence is declared in this vocabulary.	0..1
linked schemas	dct:conformsTo	dct:Standard	This property refers to an established schema to which the described Distribution conforms.	0..n

Property	URI	Range	Usage note	Card. dcata pop
media type	dcat:mediaType, subproperty of dct:format	dct:MediaTypeOrExtent	This property refers to the media type of the Distribution. The values are concepts of IANA table	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 The values are concepts of ADMS status vocabulary	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

5.4.2 Properties defined by dcat application profile for EU Publications Office

Property	URI	Range	Usage note	Card. dcata pop
access url translation of resource	dcatapop:accessUrlTranslation	rdfs:Resource	This property contains a URL that gives access to translations of the Distribution of the Dataset.	0..n
distribution type	dct:type	skos:Concept	This property contains a description on how the data is accessible with this distribution: download, visualization, api… The values are concepts of MDR Distribution Type	1…1
extension for value	dcatapop:extensionValue	dcatapop:DataExtension	The property allows to add a value metadata to describe the Distribution. The purpose of this mechanism is to allow flexibility to the application profile and answer specific business related needs.	0..n
extension for literal	dcatapop:extensionLiteral	dcatapop:DataExtension	The property allows to add a literal metadata to describe the Distribution. The purpose of this mechanism is to allow flexibility to the application profile and answer specific business related needs.	0..n
iframe	dcatapop:iframe	rdfs:Integer	Embed code to give access to visualisation of the dataset. Only used for Distribution of type "visualization".	0..1
number of downloads	dcatpop:numberOfDownloads	rdfs:Integer	This property indicates the number of time the distribution has been downloaded.	0..1

5.4.3 Properties defined by geo dcat ap

Property	URI	Range	Usage note	Card. dcata pop
Spatial representation type	adms:representationTechnique	rdfs:Literal	Property to describe the "method used to represent geographic information in the dataset". Use ISO 19115 - MD_SpatialRepresenationTypeCode for the values.	0..1

5.5 Agent

Property	URI	Range	Usage note	Card. dcata pop
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
type	dct:type	skos:Concept	This property refers to a type of the agent that makes the Catalogue or Dataset available. The values are concepts of ADMS publisher type vocabulary	0..1

5.6 Category Scheme (skos:ConceptScheme)

Property	URI	Range	Usage note	Card. dcata pop
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

5.7 Category (skos:Concept)

Property	URI	Range	Usage note	Card. dcata pop
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

5.8 Checksum

Property	URI	Range	Usage note	Card. dcata pop
Property	**URI**	**Range**	**Usage note**	**Card.**

Property	URI	Range	Usage note	Card. dcata pop
algorithm	spdx:algorithm	spdx:checksumAlgorit hm_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

5.9 Data Extension

Property	URI	Range	Usage note	Card. dcata pop
Property	**URI**	**Range**	**Usage note**	**Card.**
Text extension	dcatapop:dataExte nsionLiteral	rdfs:Literal	Property to store a text value	0..n
Numeric extension	dcatapop:dataExte nsionValue	xsd:integer	Property to store a numeric value	0..n
Extension name	dct:title	rdfs:Literal	Name of the type of data stored in the extension	1..n

5.10 Document

Property	URI	Range	Usage note	Card. dcata pop
Property	**URI**	**Range**	**Usage note**	**Card.**
description	dct:description	rdfs:Literal	Description of the documentation	0..n
format	dct:format	dct:MediaTypeOrExtent	This property refers to the file format of the Documentation. The values are concepts of MDR File type	0..1
title	dct:title	rdfs:Literal	Title of the documentation	1..n
topic	foaf:topic (inverse of foaf:page)	dcat:Dataset	The topic property relates a documentation to the dataset that the documentation is about.	1..n
type	dct:type	skos:Concept	Type of the documentation. The values are concepts of MDR Documentation type	1..1
url	schema:url	rdfs:Resource	url of the documentation	1..n

5.11 Identifier

Property	URI	Range	Usage note	Card. dcata pop

Property	URI	Range	Usage note	Card. dcata pop
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[11]	This property contains a string that is an identifier in the context of the identifier scheme referenced by its datatype.	1..1
agency	adms:schemaAgency	rdfs:Literal	The name of the agency that issued the identifier	0..1
release date	dct:issued	rdfs:Literal typed as xsd:date or xsd:dateTime	This property provides the date on which the identifier was issued.	0..1

5.12 Licence Document

Property	URI	Range	Usage note	Card. dcata pop
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

5.13 Period of Time

5.13.1 Optional properties for Period of Time

Property	URI	Range	Usage note	Card. dcata pop
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)

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[11] DataCite Resource Identifier Scheme. http://purl.org/spar/datacite/ResourceIdentifierScheme

6 CONTROLLED VOCABULARIES

6.1 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.

6.2 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[12]	http://www.iana.org/assignments/media-types/media-types.xhtml	
dcat:theme	Dataset	Dataset Theme Vocabulary	http://publications.europa.eu/resource/authority/data-theme, 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[13]	http://publications.europa.eu/mdr/authority/frequency	
dct:accessRights	Dcat:Dataset	MDR access rigths	http://publications.europa.eu/mdr/authority/access-right/	
dct:format	Distribution Documentation	MDR File Type Named Authority List[14]	http://publications.europa.eu/mdr/authority/file-type/	

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[12] Internet Assigned Numbers Authority (IANA). Media Types http://www.iana.org/assignments/media-types/

[13] Publications Office of the European Union. Metadata Registry. Authorities. Frequencies. http://publications.europa.eu/mdr/authority/frequency

Property URI	Used for Class	Vocabulary name	Vocabulary URI	Usage note
dct:language	Catalogue, Dataset	MDR Languages Named Authority List[15]	http://publications.europa.eu/mdr/authority/language/	
dct:licence	Distribution	MDR Licence NAL	http://publications.europa.eu/mdr/authority/licence/	
dct:publisher	Catalogue, Dataset	MDR Corporate bodies Named Authority List[16]	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 List17, MDR Countries Named Authority List18, MDR Places Named Authority List, MDR Administrative territorial units, Geonames	http://publications.europa.eu/mdr/authority/country/, http://publications.europa.eu/mdr/authority/place/, http://publications.europa.eu/mdr/authority/continent/, http://publications.europa.eu/mdr/authority/atu/, 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/	:created, :updated, :deleted
adms:status	Distribution	ADMS status vocabulary	http://publications.europa.eu/mdr/resource/authority/dataset-status/	The list of terms in the ADMS status vocabulary is included in the ADMS specification[19]
dct:subject	Dataset	EuroVoc, Gemet…	http://eurovoc.europa.eu/100141, https://www.eionet.europa.eu/gemet	The list of terms can belong to another domain specific controlled vocabulary
dcatapop:temporalGranularity	Dataset	MDR Time period	http://publications.europa.eu/mdr/authority/timeperiod/	
dct:type	Dataset	MDR Distribution type	http://publications.europa.eu/mdr/authority/dataset-type/	
dct:type	Distribution	MDR Distribution type	http://publications.europa.eu/mdr/authority/distribution-type/	
dct:type	Document	MDR Documentation type	http://publications.europa.eu/mdr/authority/documentation-type/	
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

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[14] Publications Office of the European Union. Metadata Registry. Authorities. File types. http://publications.europa.eu/mdr/authority/file-type/
[15] Publications Office of the European Union. Metadata Registry. Authorities. Languages. http://publications.europa.eu/mdr/authority/language/
[16] Publications Office of the European Union. Metadata Registry. Authorities. Corporate bodies. http://publications.europa.eu/mdr/authority/corporate-body/
[17] Publications Office of the European Union. Metadata Registry. Authorities. Continents. http://publications.europa.eu/mdr/authority/continent/
[18] Publications Office of the European Union. Metadata Registry. Authorities. Countries. http://publications.europa.eu/mdr/authority/country/
[19] European Commission. Joinup. Asset Description Metadata Schema (ADMS). ADMS 1.00. http://joinup.ec.europa.eu/asset/adms/release/100

Property URI	Used for Class	Vocabulary name	Vocabulary URI	Usage note
				specification
dct:type	Licence Document	ADMS licence type vocabulary	[http://purl.org/adms/licence type/](http://purl.org/adms/licencetype/)	The list of terms in the ADMS licence type vocabulary is included in the ADMS specification

7 CONFORMANCE STATEMENT

7.1 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 5.1.

- Provide descriptions of Datasets in the Catalogue, including at least the mandatory properties specified in section 5.3.

- Provide descriptions of Distributions, if any, of Datasets in the Catalogue, including at least the mandatory properties specified in section 5.4.

- Provide descriptions of all organisations involved in the descriptions of Catalogue and Datasets, including at least the mandatory properties specified in section 5.5.

- 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 5.6.

- Provide descriptions of all categories involved in the descriptions of Datasets in the Catalogue, including at least the mandatory properties specified in section 5.7.

- Provide descriptions of all document involved in the descriptions of Datasets, including at least the mandatory properties specified in section 5.10.

For the properties listed in the table in section 6, the associated controlled vocabularies MUST be used. Additional controlled vocabularies MAY be used.

In addition to the mandatory properties, any of the other properties defined in section 5 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.

7.2 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 4.

- Process information for all properties specified in section 5.

- Process information for all controlled vocabularies specified in section 6.2.

As stated in section 2, "**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.).

8 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 are defined by BCP47[20], which allows the use of the "t" extension for text transformations defined in RFC6497[21] with the field "t0"[22] 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[23] 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.

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[20] Internet Engineering Task Force (IETF). BCP47. Tags for Identifying Languages. http://tools.ietf.org/html/bcp47

[21] Internet Engineering Task Force (IETF). BCP47 Extension T – Transformed Content. http://tools.ietf.org/html/rfc6497

[22] UNICODE Consortium. CLDR - Unicode Common Locale Data Repository. BCP47, transform_mt.xml. http://unicode.org/cldr/trac/browser/trunk/common/bcp47/transform_mt.xml

[23] Apache Web Server: content negotiation. http://httpd.apache.org/docs/current/content-negotiation.html

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.

9 ANNEX I. QUICK REFERENCE OF CLASSES AND PROPERTIES INCLUDING GEODCAT-AP AND DCAT-STAT-AP

Class	Class URI	Mandatory properties	Optional proproperties
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	dcat:record dcat:themeTaxonomy dct:hasPart dct:isPartOf dct:issued dct:language dct:license dct:modified dct:rights dct:spatial foaf:homepage dct:created
Catalogue Record	dcat:CatalogRecord	dct:modified foaf:primaryTopic	dct:conformsTo adms:status dct:issued dct:description dct:language dct:source dct:title dcatapop:numberOfViews cnt:caracterEncoding
Checksum	spdx:Checksum	spdx:algorithm spdx:checksumValue	
Data Extension	dcatapop:DataExtension	dct:title	dcatapop:dataExtensionLiteral dcatapop:dateExtensionValue
Dataset	dcat:Dataset	dct:description dct:title ckan-name	adms:identifier adms:sample adms:versionNotes dcat:contactPoint dcat:distribution dcat:keyword dcat:landingPage dcat:theme dct:accessRights dct:accrualPeriodicity dct:conformsTo dct:hasVersion dct:identifier dct:issued dct:isVersionOf dct:language dct:modified dct:provenance dct:publisher dct:relation dct:source dct:spatial dct:temporal dct:type foaf:page owl:versionInfo

			dct:alternative dct:subject dct:creator dcatapop:datasetGroup dcatapop:extensionLiteral dcatapop:extensionValue dct:hasPart dct:isPartOf dcatapop:isPartOfCatalog dcatapop:applicationUsingDataset dcatapop:temporalGranularity cnt :caracterEncoding
Distribution	dcat:Distribution	dcat:accessURL dct:type	adms:status dcat:byteSize dcat:downloadURL dcat:mediaType dct:conformsTo dct:description dct:format dct:issued dct:language dct:license dct:modified dct:rights dct:title foaf:page spdx:checksum dcatapop:accessUrlTranslation dcatapop:extensionLiteral dcatapop:extensionValue dcatapop :iframe dcatapop :numberOfDownloads adms :representationTechnique
Document	foaf:Document	dct:title foaf:topic dct:type schema:url	dct:description dct:format
Frequency	dct:Frequency		
Identifier	adms:Identifier	skos:notation	adms:schemaAgency dct:issued
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		