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**Information technology — Metadata  
registries (MDR) —**

**Part 7:**

**Metamodel for data set registration**

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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)) or the IEC list of patent declarations received (see <http://patents.iec.ch>).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

A list of all parts in the ISO/IEC 11179 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

Many data sets are now generally available. These may be part of a government-led open data initiative, or may be data sets that are used within and across organizations for commercial, scientific or academic purposes.

There is a requirement for metadata about these data sets to be readily available to enable the consistent and appropriate use of data and information, and to prevent duplication of work. Having an enhanced *Metadata Registry* where metadata that describes data sets is registered will facilitate the discovery of appropriate data sets.

In ISO/IEC 11179-3:2013, Clauses 5 to 11 the structure of a *Metadata Registry* is specified in the form of a conceptual data model. The *Metadata Registry* is used to keep information about data elements and associated concepts, such as “data element concepts”, “conceptual domains” and “value domains”. Generically, these are all referred to as “metadata items”. Such metadata are necessary to clearly describe, record, analyse, classify and administer data. This document provides a specification of the extensions to the registry metamodel specified in ISO/IEC 11179-3:2013, Clauses 5 to 11 to enable the registration of metadata about datasets.

When considering data and metadata, it is important to distinguish between types of data/metadata, and instances of these types. ISO/IEC 11179-3:2013, Clauses 5 to 11 specifies the types of metadata objects that form the structure of a basic *Metadata Registry*. [Clause 5](#) specifies the types of metadata objects that form an extension to that structure so that the whole structure provides facilities to keep information about data sets. A *Metadata Registry* will be populated with instances of these metadata objects (metadata items), which in turn define, for example, types of data in an application database, or, in the case of this document, data sets that are held elsewhere. Such data sets could, for example, be made available over the internet or be included as a table within a word processing document.

The facilities described in this document, together with those described in ISO/IEC 11179-3:2013, Clauses 5 to 11 provides the ability to record the following data set metadata:

- one or more unique identifiers for the data set;
- the designation or title of the data set;
- a definition or description of the data set that provides sufficient detail to enable a user to quickly understand whether this data set is of interest;
- the date the data set was issued and, if appropriate, the date that subsequent versions of the data set were, or will be, issued;
- the access level and rights associated with the data set;
- the provenance of the data set, i.e., information about the place and time of the origin of the data set, its ownership and the method of the generation of the set;
- a set of keywords or tags that help to explain the data set;
- the language or languages used to describe the data set;
- the temporal and spatial coverages of the data set;
- the accrual periodicity of the data set, i.e., the frequency at which new, revised or updated versions of the data set are made available;
- the details of the distributions of the data set, including the identifier, the title, a description, the media type or file format, the size, the issue date, languages, access level and rights and access and download URLs;
- annotations drawn from a concept system, such as an ontology, to describe the theme or category of the data set or the collection of data sets;

- the details of any contexts, such as a programme, project or business area that use the data set;
- the details of any quality assessments made in respect of the data set;
- any additional descriptions of the data set, including:
  - any data elements that are already registered that are included in the data set;
  - any information models that describe the structure of the information in the data set;
  - any documents which describe aspects of the data set, such as technical information about the data set and/or developer documentation such as a graphical representation of the data model of the data set;
- the details of any superset/subset hierarchies containing the data set;
- the details of any replacement data set if this data set is superseded;
- the details of any collection of data sets of which this data set is a part, including the identifiers, the designation or title, a definition or description, issue dates, languages, access level, rights, the spatial coverage, the provenance and any quality assessments of the collection.

This document was prepared taking into account concepts described in the following documents:

- Data Catalog Vocabulary (DCAT)<sup>[1]</sup> (published by the World Wide Web Consortium (W3C));
- The PROV Ontology (Prov-O)<sup>[2]</sup> (published by the World Wide Web Consortium (W3C));
- The PROV Data Model (Prov-DM)<sup>[3]</sup> (published by the World Wide Web Consortium (W3C));
- Project Open Data Metadata Schema v1.1<sup>[4]</sup> (published by the US Government).

Supplementary material is provided in Annexes as follows:

- [Annex A](#) provides an alphabetical list of the terms used in this document;
- [Annex B](#) provides two examples of the registration of data sets using the facilities specified in this document;
- [Annex C](#) summarizes conformance profiles specified in this document that are additional to those specified in ISO/IEC 11179-3:2013, Clause 4;
- [Annex D](#) provides a complete description of how the concept of provenance can be captured using the facilities specified in this document.

# Information technology — Metadata registries (MDR) —

## Part 7:

## Metamodel for data set registration

### 1 Scope

This document provides a specification for an extension to a Metadata Registry (MDR), as specified in ISO/IEC 11179-3:2013, Clauses 5 to 11 in which metadata which describes data sets, collections of data available for access or download in one or more formats, can be registered. Since a set can contain a single element, this document enables the recording of metadata about a single data value.

The registered metadata provides information about the data set that includes the provenance and the quality of the dataset.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 11179-3:2013, *Information technology — Metadata registries (MDR) — Part 3: Registry metamodel and basic attributes*

ISO/IEC 11179-6, *Information technology — Metadata registries (MDR) — Part 6: Registration*

### 3 Terms, definitions and abbreviated terms

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 11179-3 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

##### 3.1.1

##### **access level**

level of authority required from an entity to access a protected resource

Note 1 to entry: In the context of this document, items to which an access level may be specified are limited to a data set, a data set distribution and a data set collection.

Note 2 to entry: For the public, the level of authority might describe the degree of public availability of a dataset.

EXAMPLE      Public, restricted public and non-public.

### 3.1.2

#### **accrual periodicity**

frequency with which items are added to a collection

Note 1 to entry: In the context of this document, it is assumed that an updated version of a data set is issued or made available whenever new items are added to that data set.

[SOURCE: ISO 2146:2010, 7.2.6, modified – Note 1 to entry added and EXAMPLE deleted]

### 3.1.3

#### **data element collection**

collection of data elements that may be unordered or ordered

Note 1 to entry: Examples of unordered collections are a set or a bag (or multiset). An example of an ordered collection is a list.

### 3.1.4

#### **data set**

dataset

identifiable collection of data available for access or download in one or more formats

Note 1 to entry: A data set can be a smaller grouping of data which, though limited by some constraint such as spatial extent or feature type, is located physically within a larger data set. Theoretically, a data set can be as small as a single feature or feature attribute contained within a larger data set.

Note 2 to entry: A data set may be presented in a tabular form and stored and distributed in tables in word processed documents, spread sheets or databases. It could also be presented in any one of a number of alternative formats, including AVRO, JSON, RDF and XML.

### 3.1.5

#### **data set collection**

curated collection of one or more *data sets* ([3.1.4](#))

### 3.1.6

#### **data set distribution**

specific available form of a *data set* ([3.1.4](#)) or *data set collection* ([3.1.5](#))

Note 1 to entry: Each data set might be available in different forms and each of these forms represents a different format of the data set or a different endpoint.

Note 2 to entry: Examples of distributions include a downloadable CSV file, an API or an RSS feed. This represents a general availability of a data set. It implies no information about the actual access method of the data, i.e. whether it is a direct download, API, or through accessing a Web page.

### 3.1.7

#### **data set specification**

additional formal information to describe a data set

Note 1 to entry: A data set specification may consist of zero, one or more ISO/IEC 11179-3 *Reference\_Documents*, zero, one or more ISO/IEC 19763-12 *Information\_Models* and/or zero, one or more sets of ISO/IEC 11179-3 *Data\_Elements*.

### 3.1.8

#### **information model**

graphical and textual representation of entities and the relationships between them

Note 1 to entry: An information model can exist as, at the conceptual or logical level, an entity relationship model or an object class diagram, and, at the physical level, a database schema definition.

[SOURCE: ISO/IEC 19763-12:2015, 4.2.24 modified – Note 1 to entry amended]



**3.1.9****ontology**

specification of concrete or abstract things, and the relationships among them, in a prescribed domain of knowledge

Note 1 to entry: The specification should be computer processable, such as an ontology registered as metadata using the ISO/IEC 11179-3 *Concept Region* specification.

[SOURCE: ISO/IEC 19763-3:2010, 3.1.1.1, modified – Note 1 to entry amended]

**3.1.10****provenance**

information on the place and time of origin, derivation or generation of a resource or a record or proof of authenticity or of past ownership

**3.1.11****rights**

information regarding access or restrictions based on privacy, security or other policies

Note 1 to entry: This information may explain why a “non-public” or “restricted public” data set, data set distribution or data set collection is not “public”.

Note 2 to entry: This definition is derived from Project Open Data Metadata Schema v1.1 (<https://project-open-data.cio.gov/v1.1/schema/#dataQuality>)

**3.1.12****spatial coverage**

geographical area which is the subject of a *data set* (3.1.4) or *data set collection* (3.1.5)

**3.1.13****temporal coverage**

period for which a *data set* (3.1.4) is applicable

**3.2 Abbreviated terms**

URL      uniform resource locator

**4 Conformance****4.1 Overview of conformance**

Conformance rules for a Metadata Registry are specified in ISO/IEC 11179-3:2013, Clause 4. The following subclauses extend these rules.

**4.2 Conformance by clause**

Conformance claims may also be limited to [Clause 5](#). This clause is also dependent upon one or more of ISO/IEC 11179-3:2013, Clauses 5 to 11, so conformance to this clause shall be understood to imply conformance also to relevant provisions specified in one or more of ISO/IEC 11179-3:2013, Clauses 5 to 11.

Conformance may, therefore, be claimed for a set of data structures and/or datatypes for [Clause 5](#).

**4.3 Standard profiles****4.3.1 General**

This document specifies the following standard profiles in addition to those specified in ISO/IEC 11179-3:2013, 4.4.2.

#### 4.3.2 Data Set Registry profile

This profile implements ISO/IEC 11179-3:2013, Clauses 7, 8 and 9 and [Clause 5](#).

#### 4.3.3 Extended Data Set Registry profile

This profile implements ISO/IEC 11179-3:2013, Clause 11, and also satisfies all provisions of the Data Set Registry profile.

### 5 Data Set package

#### 5.1 Data Set metamodel region

##### 5.1.1 Overview of the Data Set metamodel region

[Figure 1](#) shows the metamodel for the registration of metadata about data sets.

Instances of each of the classes shown in [Figure 1](#) shall be extended by one or more of an *identified item* (with its subtypes of *registered item*, *administered item* or *attached item*), a *designatable item* or a *classifiable item*, as specified in ISO/IEC 11179-3:2013, 5.5. See subclause [6.1.2](#) for details of the possible types for instances of each of the classes shown in [Figure 1](#).

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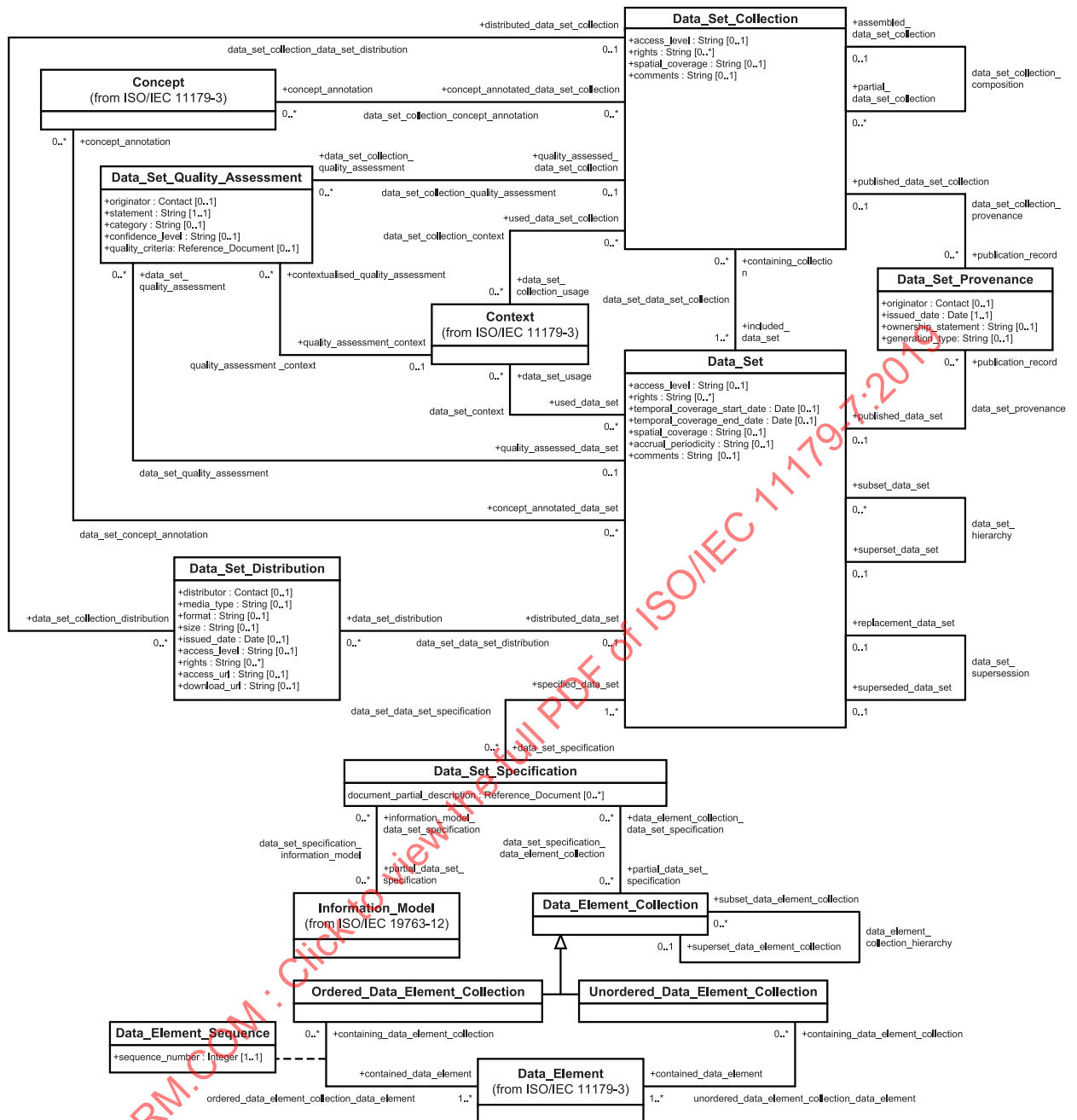


Figure 1 — Data Set metamodel region

## 5.1.2 Classes in the Data Set metamodel region

### 5.1.2.1 Concept class

The *Concept* class is described in ISO/IEC 11179-3:2013, 9.1.2.1.

In this document, the instances of the *Concept* class are used to model constructs within a concept system, that may or may not be an **ontology** (3.1.9), that are used to annotate a data set or a data set collection so as to describe the theme or category of the data set or data set collection.

A *Concept* may participate in the following additional associations specified in this document:

- *data\_set\_collection\_concept\_annotation* (5.1.4.3) with zero, one or more *concept\_annotated\_data\_set\_collection* *Data\_Set\_Collections* (5.1.2.4) in which this *Concept* is a *concept\_annotation*.
- *data\_set\_concept\_annotation* (5.1.4.8) with zero, one or more *concept\_annotated\_data\_set* *Data\_Sets* (5.1.2.5) in which this *Concept* is a *concept\_annotation*.

The *Concept* class has no additional attributes specified in this document.

#### 5.1.2.2 Context class

The *Context* class is described in ISO/IEC 11179-3:2013, 7.3.2.5.

In this document, the instances of the *Context* class are used to model a particular programme, project or business area that uses a data set (or collection of data sets), or a project or business area that is used as the context for a quality assessment of a data set (or collection of data sets),

A *Context* may participate in the following additional associations specified in this document:

- *data\_set\_context* (5.1.4.9) with zero, one or more *used\_data\_set* *Data\_Sets* (5.1.2.5) in which this *Context* is a *data\_set\_usage*.
- *data\_set\_collection\_context* (5.1.4.4) with zero, one or more *used\_data\_set\_collection* *Data\_Set\_Collections* (5.1.2.6) in which this *Context* is a *data\_set\_collection\_usage*.
- *quality\_assessment\_context* (5.1.4.20) with zero, one or more *contextualised\_quality\_assessment* *Data\_Set\_Quality\_Assessments* (5.1.2.9) in which this *Context* is a *quality\_assessment\_context*.

The *Context* class has no additional attributes specified in this document.

#### 5.1.2.3 Data\_Element class

The *Data\_Element* class is described in ISO/IEC 11179-3:2013, 11.1.2.4.

In this document, the instances of the *Data\_Element* class are used to model any registered data element that is referenced in a data set specification.

A *Data\_Element* may participate in the following additional associations specified in this document:

- *unordered\_data\_element\_collection\_data\_element* (5.1.4.21) with zero, one or more *containing\_data\_element\_collection* *Unordered\_Data\_Element\_Collections* (5.1.2.13) in which this *Data\_Element* is a *contained\_data\_element*.
- *ordered\_data\_element\_collection\_data\_element* (5.1.4.19) with zero, one or more *containing\_data\_element\_collection* *Ordered\_Data\_Element\_Collections* (5.1.2.12) in which this *Data\_Element* is a *contained\_data\_element*.

The *Data\_Element* class has no additional attributes specified in this document.

#### 5.1.2.4 Data\_Element\_Collection class

*Data\_Element\_Collection* is a class each instance of which models a particular **data element collection** (3.1.3), which is either an unordered collection of data elements or an ordered collection of data elements.

A data element collection brings together the data elements that are referenced in the specification of a particular data set.

A *Data\_Element\_Collection* shall be either an *Unordered\_Data\_Element\_Collection* (5.1.2.13) or an *Ordered\_Data\_Element\_Collection* (5.1.2.12) but not both.

A *Data\_Element\_Collection* may participate in the following associations:

- *data\_element\_collection\_hierarchy* (5.1.4.1) with:
  - zero or one *superset\_data\_element\_collection Data\_Element\_Collections* in which this *Data\_Element\_Collection* is a *subset\_data\_element\_collection*.
  - zero, one or more *subset\_data\_element\_collection Data\_Element\_Collections* in which this *Data\_Element\_Collection* is the *superset\_data\_element\_collection*.
- *data\_set\_specification\_data\_element\_collection* (5.1.4.14) with zero, one or more *data\_element\_collection\_data\_set\_specification Data\_Set\_Specifications* (5.1.2.10) in which this *Data\_Element\_Collection* is a *partial\_data\_set\_specification*.

The *Data\_Element\_Collection* class has no attributes.

### 5.1.2.5 Data\_Set class

#### 5.1.2.5.1 Description of Data\_Set

*Data\_Set* is a class each instance of which models a particular **data set** (3.1.4), which is a collection of data available for access or download in one or more formats.

A *Data\_Set* may participate in the following associations:

- *data\_set\_context* (5.1.4.9) with zero, one or more *data\_set\_usage Contexts* (5.1.2.2) in which this *Data\_Set* is a *used\_data\_set*.
- *data\_set\_data\_set\_distribution* (5.1.4.11) with zero, one or more *data\_set\_distribution Data\_Set\_Distributions* (5.1.2.7) in which this *Data\_Set* is the *distributed\_data\_set*.
- *data\_set\_data\_set\_collection* (5.1.4.10) with zero, one or more *containing\_collection Data\_Set\_Collections* (5.1.2.6) in which this *Data\_Set* is an *included\_data\_set*.
- *data\_set\_data\_set\_specification* (5.1.4.12) with zero, one or more *data\_set\_specification Data\_Set\_Specifications* (5.1.2.10) in which this *Data\_Set* is a *specified\_data\_set*.
- *data\_set\_hierarchy* (5.1.4.13) with:
  - zero, one or more *subset\_data\_set Data\_Sets* in which this *Data\_Set* is the *superset\_data\_set*.
  - zero or one *superset\_data\_set Data\_Set* in which this *Data\_Set* is a *subset\_data\_set*.
- *data\_set\_concept\_annotation* (5.1.4.8) with zero, one or more *concept\_annotation Concepts* (5.1.2.1) in which this *Data\_Set* is a *concept\_annotated\_data\_set*.
- *data\_set\_provenance* (5.1.4.14) with zero, one or more *publication\_record Data\_Set\_Provenances* (5.1.2.8) in which this *Data\_Set* is the *published\_data\_set*.
- *data\_set\_quality\_assessment* (5.1.4.15) with zero, one or more *data\_set\_quality\_assessment Data\_Set\_Quality\_Assessments* (5.1.2.9) in which this *Data\_Set* is the *quality\_assessed\_data\_set*.
- *data\_set\_supersession* (5.1.4.16) with:
  - zero or one *replacement\_data\_set Data\_Set* in which this *Data\_Set* is the *superseded\_data\_set*.
  - zero or one *superseded\_data\_set Data\_Set* in which this *Data\_Set* is the *replacement\_data\_set*.

The attributes of the *Data\_Set* class are summarized here and specified more formally in 5.1.2.5.2:

- A *Data\_Set* class may have zero or one *access\_level* (5.1.2.5.2.1) of type String, which is the degree to which this data set could have been made publicly-available, regardless of whether it has been made available. If there is an instance of *Data\_Set\_Collection* associated with this instance of *Data\_Set* and

the *access\_level* of the associated instance of *Data\_Set\_Collection* differs from the *access\_level* of this instance of *Data\_Set* then it is assumed that the *access\_level* of this instance of *Data\_Set* overrides the *access\_level* of the associated instance of *Data\_Set\_Collection*.

- A *Data\_Set* class may have zero, one or more *rights* (5.1.2.5.2.2) of type String, each of which is a statement that provides information regarding any access or restrictions based on privacy, security, or other policies that apply to this data set. This should also serve as an explanation for the selected “access\_level”.
- A *Data\_Set* class may have zero or one *temporal\_coverage\_start\_date* (5.1.2.5.2.3) of type Date, which is the start date of the period for which this data set is applicable.
- A *Data\_Set* class may have zero or one *temporal\_coverage\_end\_date* (5.1.2.5.2.4) of type Date, which is the end date of the period for which this data set is applicable.
- A *Data\_Set* class may have zero or one *spatial\_coverage* (5.1.2.5.2.5) of type String, which is the range of spatial applicability of this data set. This is the geographical area covered by the data set. This could include a named place or a description of the boundary of a spatial region. This overrides the value of the data set collection spatial coverage in the case of a conflict.
- A *Data\_Set* class may have zero or one *accrual\_periodicity* (5.1.2.5.2.6) of type String, which is the frequency at which new, revised or updated versions of this data set are made available.
- A *Data\_Set* class may have zero or one *comments* (5.1.2.5.2.7) of type String, which is a collection of additional information that is known about the data set.

#### 5.1.2.5.2 Attributes of *Data\_Set*

##### 5.1.2.5.2.1 *access\_level*

Attribute name: *access\_level*

Definition: statement of the degree to which this data set could have been made publicly-available, regardless of whether it has been made available

Obligation: Optional

Multiplicity: 0..1

Data type: String

##### 5.1.2.5.2.2 *rights*

Attribute name: *rights*

Definition: statement that provides information regarding any access or restrictions based on privacy, security, or other policies that apply to this data set

Obligation: Optional

Multiplicity: 0..\*

Data type: String

**5.1.2.5.2.3 temporal\_coverage\_start\_date**

Attribute name: *temporal\_coverage\_start\_date*  
 Definition: start date of the period for which this data set is applicable  
 Obligation: Optional  
 Multiplicity: *0..1*  
 Data type: Date

**5.1.2.5.2.4 temporal\_coverage\_end\_date**

Attribute name: *temporal\_coverage\_end\_date*  
 Definition: end date of the period for which this data set is applicable  
 Obligation: Optional  
 Multiplicity: *0..1*  
 Data type: Date

**5.1.2.5.2.5 spatial\_coverage**

Attribute name: *spatial\_coverage*  
 Definition: range of spatial applicability of this data set  
 Obligation: Optional  
 Multiplicity: *0..1*  
 Data type: String

**5.1.2.5.2.6 accrual\_periodicity**

Attribute name: *accrual\_periodicity*  
 Definition: frequency at which new, revised or updated versions of this data set are made available  
 Obligation: Optional  
 Multiplicity: *0..1*  
 Data type: String

**5.1.2.5.2.7 comments**

Attribute name: *comments*  
 Definition: collection of additional information that is known about the data set  
 Obligation: Optional  
 Multiplicity: *0..1*  
 Data type: String



— End of attributes of *Data\_Set* —

### 5.1.2.6 *Data\_Set\_Collection* class

#### 5.1.2.6.1 Description of *Data\_Set\_Collection*

*Data\_Set\_Collection* is a class each instance of which models a particular **data set collection** (3.1.5), which is a curated collection of one or more data sets. Such a 'collection' may take the form of a catalogue of data sets.

A *Data\_Set\_Collection* shall participate in the following association:

- *data\_set\_data\_set\_collection* (5.1.4.10) with one or more *included\_data\_set Data\_Sets* (5.1.2.5) in which this *Data\_Set\_Collection* is a *containing\_collection*.

A *Data\_Set\_Collection* may participate in the following associations:

- *data\_set\_collection\_composition* (5.1.4.2) with:
  - zero, one or more *partial\_data\_set\_collection Data\_Set\_Collections* in which this *Data\_Set\_Collection* is an *assembled\_data\_set\_collection*.
  - zero or one *assembled\_data\_set\_collection Data\_Set\_Collection* in which this *Data\_Set\_Collection* is a *partial\_data\_set\_collection*.
- *data\_set\_collection\_context* (5.1.4.4) with zero, one or more *data\_set\_collection\_usage Contexts* (5.1.2.2) in which this *Data\_Set\_Collection* is a *used\_data\_set\_collection*.
- *data\_set\_collection\_concept\_annotation* (5.1.4.3) with zero, one or more *concept\_annotation Concepts* (5.1.2.1) in which this *Data\_Set\_Collection* is a *concept\_annotated\_data\_set\_collection*.
- *data\_set\_collection\_data\_set\_distribution* (5.1.4.5) with zero, one or more *data\_set\_collection\_distribution Data\_Set\_Distribution* (5.1.2.7) in which this *Data\_Set\_Collection* is a *distributed\_data\_set\_collection*.
- *data\_set\_collection\_provenance* (5.1.4.6) with zero, one or more *publication\_record Data\_Set\_Provenances* (5.1.2.8) in which this *Data\_Set\_Collection* is the *published\_data\_set\_collection*.
- *data\_set\_collection\_quality\_assessment* (5.1.4.7) with zero, one or more *data\_set\_collection\_quality\_assessment Data\_Set\_Quality\_Assessments* (5.1.2.9) in which this *Data\_Set\_Collection* is the *quality\_assessed\_data\_set\_collection*.

The attributes of the *Data\_Set\_Collection* class are summarized here and specified more formally in 5.1.2.6.2:

- A *Data\_Set\_Collection* class may have zero or one *access\_level* (5.1.2.6.2.1) of type String, which is a statement of the degree to which this data set collection could have been made publicly-available, regardless of whether it has been made available.
- A *Data\_Set\_Collection* class may have zero, one or more *rights* (5.1.2.6.2.2) of type String, each of which is a statement that provides information regarding any access or restrictions based on privacy, security, or other policies that apply to this data set collection. This should also serve as an explanation for the selected "access\_level".
- A *Data\_Set\_Collection* class may have zero or one *spatial\_coverage* (5.1.2.6.2.3) of type String, which is the range of spatial applicability of this data set collection. This is the geographical area covered by the data set collection. This could include a named place or a description of the boundary of a spatial region.
- A *Data\_Set\_Collection* class may have zero or one *comments* (5.1.2.6.2.4) of type String, which is a collection of additional information that is known about the data set collection.



**5.1.2.6.2 Attributes of Data\_Set\_Collection****5.1.2.6.2.1 access\_level**

Attribute name: *access\_level*

Definition: statement of the degree to which this data set collection could have been made publicly-available, regardless of whether it has been made available

Obligation: Optional

Multiplicity: *0..1*

Data type: String

**5.1.2.6.2.2 rights**

Attribute name: *rights*

Definition: statement that provides information regarding any access or restrictions based on privacy, security, or other policies that apply to this data set collection

Obligation: Optional

Multiplicity: *0..\**

Data type: String

**5.1.2.6.2.3 spatial\_coverage**

Attribute name: *spatial\_coverage*

Definition: range of spatial applicability of this data set collection

Obligation: Optional

Multiplicity: *0..1*

Data type: String

**5.1.2.6.2.4 comments**

Attribute name: *comments*

Definition: collection of additional information that is known about the data set collection

Obligation: Optional

Multiplicity: *0..1*

Data type: String

—— End of attributes of *Data\_Set\_Collection* ——

### 5.1.2.7 Data\_Set\_Distribution class

#### 5.1.2.7.1 Description of Data\_Set\_Distribution

*Data\_Set\_Distribution* is a class each instance of which models a particular **data set distribution** (3.1.6), which is a specific available form of a data set or a data set collection.

Each data set or data set collection might be available in different forms and each of these forms represents a different format of the data set or a different endpoint. Examples of distributions include a downloadable CSV file, an API or an RSS feed. This represents a general availability of a data set. It implies no information about the actual access method of the data, i.e., whether it is available through a direct download, through an API, or through accessing a webpage.

A *Data\_Set\_Distribution* may participate in the following association:

- *data\_set\_data\_set\_distribution* (5.1.4.11) with zero or one *distributed\_data\_set Data\_Set* (5.1.2.5) in which this *Data\_Set\_Distribution* is a *data\_set\_distribution*.
- *data\_set\_collection\_data\_set\_distribution* (5.1.4.5) with zero or one *distributed\_data\_set\_collection Data\_Set\_Collection* (5.1.2.6) in which this *Data\_Set\_Distribution* is a *data\_set\_collection\_distribution*.

The attributes of the *Data\_Set\_Distribution* class are summarized here and specified more formally in 5.1.2.7.2:

- A *Data\_Set\_Distribution* class may have zero or one *distributor* (5.1.2.7.2.1) of type Contact (as specified in ISO/IEC 11179-3:2013, 6.3.2), which is a specification of the individual or organization responsible for the ownership and publication of the data set.
- A *Data\_Set\_Distribution* class may have zero or one *media\_type* (5.1.2.7.2.2) of type String, which is a machine-readable file format of this data set distribution as defined by the Internet Assigned Numbers Authority (IANA) [5].
- A *Data\_Set\_Distribution* class may have zero or one *format* (5.1.2.7.2.3) of type String, which is a human-readable description of the file format of this data set distribution.
- A *Data\_Set\_Distribution* class may have zero or one *size* (5.1.2.7.2.4) of type String, which is the size of this data set distribution expressed in bytes or multiples of bytes. This may be an approximation when the precise size is not known.
- A *Data\_Set\_Distribution* class may have zero or one *issued\_date* (5.1.2.7.2.5) of type Date, which is the date on which this data set distribution was formally issued or made available.
- A *Data\_Set\_Distribution* class may have zero or one *access\_level* (5.1.2.7.2.6) of type String, which is a statement of the degree to which this data set distribution could have been made publicly-available, regardless of whether it has been made available.
- A *Data\_Set\_Distribution* class may have zero, one or more *rights* (5.1.2.7.2.7) of type String, each of which is a statement that provides information regarding any access or restrictions based on privacy, security, or other policies that apply to this data set distribution. This should also serve as an explanation for the selected “access\_level”.
- A *Data\_Set\_Distribution* class may have zero or one *access\_url* (5.1.2.7.2.8) of type String, which is the URL for an indirect means of accessing the related data set via this data set distribution.
- A *Data\_Set\_Distribution* class may have zero or one *download\_url* (5.1.2.7.2.9) of type String, which is the URL for a direct means of accessing the related data set via this data set distribution.

**5.1.2.7.2 Attributes of Data\_Set\_Distribution****5.1.2.7.2.1 distributor**

Attribute name:	<i>distributor</i>
Definition:	specification of the individuals or organizations responsible for the ownership and publication of the data set
Obligation:	Optional
Multiplicity:	0..1
Data type:	Contact (as specified in ISO/IEC 11179-3:2013, 6.3.2)

**5.1.2.7.2.2 media\_type**

Attribute name:	<i>media_type</i>
Definition:	machine-readable file format of this data set distribution as defined by the Internet Assigned Numbers Authority (IANA)
Obligation:	Optional
Multiplicity:	0..1
Data type:	String
Examples:	"text/csv"; "application/schema+json"

**5.1.2.7.2.3 format**

Attribute name:	<i>format</i>
Definition:	human-readable description of the file format of this data set distribution
Obligation:	Optional
Multiplicity:	0..1
Data type:	String
Example:	" <a href="http://www.agency.gov/vegetables/schema.json">http://www.agency.gov/vegetables/schema.json</a> "

**5.1.2.7.2.4 size**

Attribute name:	<i>size</i>
Definition:	size of this data set distribution expressed in bytes or multiples of bytes
Obligation:	Optional
Multiplicity:	0..1
Data type:	String
Examples:	"34KB", "250KB"

**5.1.2.7.2.5 issued\_date**

Attribute name: *issued\_date*

Definition: date on which this data set distribution was formally issued or made available

Obligation: Optional

Multiplicity: *0..1*

Data type: Date

**5.1.2.7.2.6 access\_level**

Attribute name: *access\_level*

Definition: statement of the degree to which this data set distribution could have been made publicly-available, regardless of whether it has been made available

Obligation: Optional

Multiplicity: *0..1*

Data type: String

**5.1.2.7.2.7 rights**

Attribute name: *rights*

Definition: statement that provides information regarding any access or restrictions based on privacy, security, or other policies that apply to this data set distribution

Obligation: Optional

Multiplicity: *0..\**

Data type: String

**5.1.2.7.2.8 access\_url**

Attribute name: *access\_url*

Definition: URL for an indirect means of accessing the related data set via this data set distribution

Obligation: Optional

Multiplicity: *0..1*

Data type: String

#### 5.1.2.7.2.9 download\_url

Attribute name: *download\_url*

Definition: URL for a direct means of accessing the related data set via this data set distribution

Obligation: Optional

Multiplicity: 0..1

Data type: String

— End of attributes of *Data\_Set\_Distribution* —

#### 5.1.2.7.3 Constraints on Data\_Set\_Distribution

An instance of the *Data\_Set\_Distribution* class shall only exist if at least one of the *data\_set\_data\_set\_distribution* association or the *data\_set\_collection\_data\_set\_distribution* association is instantiated.

For each instance of *Data\_Set\_Distribution* either a value for the attribute *media\_type* or a value for the attribute *format* may be specified, but not both. The attribute *media\_type* should be used when the media type of the distribution is defined by IANA and an appropriate value for the attribute *download\_url* should also be specified. Otherwise the attribute *format* should be used with different values.

#### 5.1.2.8 Data\_Set\_Provenance class

##### 5.1.2.8.1 Description of Data\_Set\_Provenance

*Data\_Set\_Provenance* is a class each instance of which models a particular **provenance** (3.1.10) of a data set or data set collection, which is a record of information on the place and time of origin, derivation or generation of the data set or data set collection.

The concept of provenance of a data set or data set collection includes proof of authenticity or of past ownership.

A *Data\_Set\_Provenance* may participate in the following associations:

- *data\_set\_collection\_provenance* (5.1.4.6) with zero or one *published\_data\_set\_collection Data\_Set\_Collection* (5.1.2.6) in which this *Data\_Set\_Provenance* is a *publication\_record*.
- *data\_set\_provenance* (5.1.4.14) with zero or one *published\_data\_set Data\_Set* (5.1.2.5) in which this *Data\_Set\_Provenance* is a *publication\_record*.

The attributes of the *Data\_Set\_Provenance* class are summarized here and specified more formally in 5.1.2.8.2:

- A *Data\_Set\_Provenance* class may have zero or one *originator* (5.1.2.8.2.1) of type Contact (as specified in ISO/IEC 11179-3:2013, 6.3.2), which is a specification of the individual or organization responsible for the origination of the data set or data set collection.
- A *Data\_Set\_Provenance* class shall have one and only one *issued\_date* (5.1.2.8.2.2) of type Date, which is the date on which the associated version of the data set or data set collection was issued.
- A *Data\_Set\_Provenance* class may have zero or one *ownership\_statement* (5.1.2.8.2.3) of type String, which is a statement of the type of ownership of the associated version of the data set or data set collection. Possible examples include “self-owned”, “publicly available”, “available with restrictions”, “data for hire” and “derived data”.
- A *Data\_Set\_Provenance* class may have zero or one *generation\_type* (5.1.2.8.2.4) of type String, which is a statement specifying how the associated data set or data set collection was generated. Possible examples include “generated by sensors” and “derived from observations”.

#### 5.1.2.8.2 Attributes of Data\_Set\_Provenance

##### 5.1.2.8.2.1 originator

Attribute name: *originator*

Definition: specification of the individual or organization responsible for the origination of the data set or data set collection

Obligation: Optional

Multiplicity: *0..1*

Data type: Contact (as specified in ISO/IEC 11179-3:2013, 6.3.2)

##### 5.1.2.8.2.2 issued\_date

Attribute name: *issued\_date*

Definition: date on which the associated version of the data set or data set collection was issued

Obligation: Mandatory

Multiplicity: *1..1*

Data type: Date

##### 5.1.2.8.2.3 ownership\_statement

Attribute name: *ownership\_statement*

Definition: statement of the type of ownership of the associated version of the data set or data set collection

Obligation: Optional

Multiplicity: *0..1*

Data type: String

##### 5.1.2.8.2.4 generation\_type

Attribute name: *generation\_type*

Definition: statement specifying how the associated data set or data set collection was generated

Obligation: Optional

Multiplicity: *0..1*

Data type: String

—— End of attributes of *Data\_Set\_Provenance* ——

### 5.1.2.8.3 Constraints on Data\_Set\_Provenance

An instance of the *Data\_Set\_Provenance* class shall only exist if at least one of the *data\_set\_provenance* association or the *data\_set\_collection\_provenance* association is instantiated.

### 5.1.2.9 Data\_Set\_Quality\_Assessment class

#### 5.1.2.9.1 Description of Data\_Set\_Quality\_Assessment

*Data\_Set\_Quality\_Assessment* is a class each instance of which models a particular quality assessment, which is an assessment of the quality of a data set or data set collection. This assessment may be based on a particular quality dimension or may be a more general assessment of quality.

The quality dimensions against which quality is assessed may be derived from international standards, such as ISO 8000-8<sup>[6]</sup> ISO 19157<sup>[7]</sup> and ISO/IEC 25012<sup>[8]</sup> or may from more informal schemes.

Quality dimensions in more informal schemes may be along the lines of “accuracy”, “relevance”, “consistency” and “completeness”.

A *Data\_Set\_Quality\_Assessment* may participate in the following associations:

- *data\_set\_collection\_quality\_assessment* (5.1.4.7) with zero or one *quality\_assessed\_data\_set\_collection Data\_Set\_Collection* (5.1.2.6) in which this *Data\_Set\_Quality\_Assessment* is a *data\_set\_collection\_quality\_assessment*.
- *data\_set\_quality\_assessment* (5.1.4.15) with zero or one *quality\_assessed\_data\_set Data\_Set* (5.1.2.5) in which this *Data\_Set\_Quality\_Assessment* is a *data\_set\_quality\_assessment*.
- *quality\_assessment\_context* (5.1.4.20) with zero or one *quality\_assessment\_context Context* (5.1.2.2) in which this *Data\_Set\_Quality\_Assessment* is a *contextualised\_quality\_assessment*.

The attributes of the *Data\_Set\_Quality\_Assessment* class are summarized here and specified more formally in 5.1.2.9.2:

- A *Data\_Set\_Quality\_Assessment* class may have zero or one *originator* (5.1.2.9.2.1) of type Contact (as specified in ISO/IEC 11179-3:2013, 6.3.2), which is a specification of the individual or organization responsible for the assessment of the quality of the data set or data set collection.
- A *Data\_Set\_Quality\_Assessment* class shall have one and only one *statement* (5.1.2.9.2.2) of type String, which is a statement of the assessment of the quality of the data within the data set assessed using the quality dimension of this assessment.
- A *Data\_Set\_Quality\_Assessment* class may have one and only one *category* (5.1.2.9.2.3) of type String, which is a statement of the quality dimension against which the assessment of the quality of the data within the data set is assessed.
- A *Data\_Set\_Quality\_Assessment* class may have zero or one *confidence\_level* (5.1.2.9.2.4) of type String, which is a statement of the confidence level, if any, of this assessment of the quality of the data within the data set assessed using the quality dimension of this assessment.
- A *Data\_Set\_Quality\_Assessment* class may have zero or one *quality\_criteria* (5.1.2.9.2.5) of type Reference\_Document (as specified in ISO/IEC 11179-3:2013, 6.3.7), which is a document that specifies the criteria against which this assessment of the quality of the data within the data set has been assessed.

#### 5.1.2.9.2 Attributes of Data\_Set\_Quality\_Assessment

##### 5.1.2.9.2.1 originator

Attribute name: *originator*

Definition: specification of the individual or organization responsible for the assessment of the quality of the data set or data set collection.

Obligation: Optional

Multiplicity: *0..1*

Data type: Contact (as specified in ISO/IEC 11179-3:2013, 6.3.2)

##### 5.1.2.9.2.2 statement

Attribute name: *statement*

Definition: statement of the assessment of the quality of the data within the data set assessed using the quality dimension of this assessment

Obligation: Mandatory

Multiplicity: *1..1*

Data type: String

##### 5.1.2.9.2.3 category

Attribute name: *category*

Definition: statement of the quality dimension against which the assessment of the quality of the data within the data set is assessed

Obligation: Optional

Multiplicity: *0..1*

Data type: String

##### 5.1.2.9.2.4 confidence\_level

Attribute name: *confidence\_level*

Definition: statement of the confidence level, if any, of this assessment of the quality of the data within the data set assessed using the quality dimension of this assessment

Obligation: Optional

Multiplicity: *0..1*

Data type: String



#### 5.1.2.9.2.5 **quality\_criteria**

Attribute name: *quality\_criteria*

Definition: document that specifies the criteria against which this assessment of the quality of the data within the data set has been assessed

Obligation: Optional

Multiplicity: 0..1

Data type: Reference\_Document (as specified in ISO/IEC 11179-3:2013, 6.3.7)

— End of attributes of *Data\_Set\_Quality\_Assessment* —

#### 5.1.2.9.3 **Constraints on Data\_Set\_Quality\_Assessment**

An instance of the *Data\_Set\_Quality\_Assessment* class shall only exist if at least one of the *data\_set\_quality\_assessment* association or the *data\_set\_collection\_quality\_assessment* association is instantiated.

#### 5.1.2.10 **Data\_Set\_Specification class**

##### 5.1.2.10.1 **Description of Data\_Set\_Specification**

*Data\_Set\_Specification* is a class each instance of which models a particular **data set specification** (3.1.7), which provides additional formal information to describe a data set.

A data set specification may consist of zero, one or more reference documents, zero, one or more information models and/or zero, one or more collections of data elements.

A *Data\_Set\_Specification* shall participate in the following association:

- *data\_set\_data\_set\_specification* (5.1.4.12) with one or more *specified\_data\_set Data\_Sets* (5.1.2.5) in which this *Data\_Set\_Specification* is a *data\_set\_specification*.

A *Data\_Set\_Specification* may participate in the following associations:

- *data\_set\_specification\_data\_element\_collection* (5.1.4.16) with zero, one or more *partial\_data\_set\_specification Data\_Element\_Collections* (5.1.2.4) in which this *Data\_Set\_Specification* is a *data\_element\_collection\_data\_set\_specification*.
- *data\_set\_specification\_information\_model* (5.1.4.17) with zero, one or more *partial\_data\_set\_specification Information\_Models* (5.1.2.11) in which this *Data\_Set\_Specification* is an *information\_model\_data\_set\_specification*.

The attribute of the *Data\_Set\_Specification* class is summarized here and specified more formally in 5.1.2.10.2:

- A *Data\_Set\_Specification* class may have zero, one or more *document\_partial\_descriptions* (5.1.2.10.2.1) of type Reference\_Document (as specified in ISO/IEC 11179-3:2013, 6.3.7), each of which is a document that provides some additional description of the data set that is the subject of the data set specification.

#### 5.1.2.10.2 Attribute of *Data\_Set\_Specification* – *document\_partial\_description*

Attribute name: *document\_partial\_description*

Definition: document providing some additional description of the data set that is the subject of the data set specification

Obligation: Optional

Multiplicity: 0..\*

Data type: Reference\_Document (as specified in ISO/IEC 11179-3:2013, 6.3.7)

— End of attribute of *Data\_Set\_Specification* —

#### 5.1.2.10.3 Constraints on *Data\_Set\_Specification*

An instance of the *Data\_Set\_Specification* class shall only exist if at least one of the following conditions applies:

- There exists at least one value for the *document\_partial\_description* attribute.
- At least one *Data\_Element\_Collection* is associated with this *Data\_Set\_Specification* through the *data\_set\_specification\_data\_element\_collection* association.
- At least one *Information\_Model* is associated with this *Data\_Set\_Specification* through the *data\_set\_specification\_information\_model* association.

#### 5.1.2.10.4 Additions to *Data\_Set\_Specification*

Where there is a requirement to add additional domain or content specific ‘attributes’ to an instance of the *Data\_Set\_Specification* class this can be achieved using the *Slot* class specified in ISO/IEC 11179-3:2013, 7.2.2.4.

#### 5.1.2.11 *Information\_Model* class

The *Information\_Model* class is described in ISO/IEC 19763-12<sup>[9]</sup>.

In this document, the instances of the *Information\_Model* class are used to model any registered **information model** (3.1.8), such as a conceptual data model, a logical data model, a UML class diagram or an SQL database schema, that describes all or part of the structure to which the data set conforms.

An *Information\_Model* may participate in the following additional association specified in this document:

- *data\_set\_specification\_information\_model* (5.1.4.17) with zero, one or more *information\_model\_data\_set\_specification* *Data\_Set\_Specifications* (5.1.2.10) in which this *Information\_Model* is a *partial\_data\_set\_specification*.

The *Information\_Model* class has no additional attributes specified in this document.

#### 5.1.2.12 *Ordered\_Data\_Element\_Collection* class

##### 5.1.2.12.1 Direct Superclass of *Ordered\_Data\_Element\_Collection*

*Data\_Element\_Collection* (5.1.2.4)

#### 5.1.2.12.2 Description of Ordered\_Data\_Element\_Collection

*Ordered\_Data\_Element\_Collection* is a class each instance of which models a particular ordered **data element collection** (3.1.3), which is a collection of data elements arranged in some sequence (for example, in a list).

An *Ordered\_Data\_Element\_Collection* shall participate in the following association:

- *ordered\_data\_element\_collection\_data\_element* (5.1.4.19) with one or more *contained\_data\_element Data\_Elements* (5.1.2.3) in which this *Ordered\_Data\_Element\_Collection* is a *containing\_data\_element\_collection*.

*Ordered\_Data\_Element\_Collection* has no attributes.

#### 5.1.2.13 Unordered\_Data\_Element\_Collection class

##### 5.1.2.13.1 Direct Superclass of Unordered\_Data\_Element\_Collection

*Data\_Element\_Collection* (5.1.2.4)

##### 5.1.2.13.2 Description of Unordered\_Data\_Element\_Collection

*Unordered\_Data\_Element\_Collection* is a class each instance of which models a particular unordered **data element collection** (3.1.3), which is a collection of data elements arranged without sequence (for example a set or bag (multiset)).

An *Unordered\_Data\_Element\_Collection* may participate in the following association:

- *unordered\_data\_element\_collection\_data\_element* (5.1.4.21) with one or more *contained\_data\_element Data\_Elements* (5.1.2.3) in which this *Unordered\_Data\_Element\_Collection* is a *containing\_data\_element\_collection*.

*Unordered\_Data\_Element\_Collection* has no attributes.

### 5.1.3 Association Classes in the Data Set metamodel region

#### 5.1.3.1 Data\_Element\_Sequence class

##### 5.1.3.1.1 Description of Data\_Element\_Sequence

*Data\_Element\_Sequence* is a class each instance of which records the sequence of a particular *Data\_Element* (5.1.2.3) within an *Ordered\_Data\_Element\_Collection* (5.1.2.12).

The association has two roles:

- *containing\_data\_element\_collection* (verb form: *comprised\_of*) which references an *Ordered\_Data\_Element\_Collection* (5.1.2.4).
- *contained\_data\_element* (verb form: *part\_of*) which references a *Data\_Element* (5.1.2.3).

A *Data\_Element\_Sequence* shall be within one and only one *containing\_data\_element\_collection*.

A *containing\_data\_element\_collection* may be comprised of zero, one or more *Data\_Element\_Sequences*.

A *Data\_Element\_Sequence* shall be reference to one and only one *contained\_data\_element*.

A *contained\_data\_element* may be contained in zero, one or more *Data\_Element\_Sequences*.

The attribute of the *Data\_Element\_Sequence* class is summarized here and specified more formally in [5.1.3.1.2](#):

- A *Data\_Element\_Sequence* class shall have one and only one *sequence\_number* ([5.1.3.1.2](#)) of type Integer, which is an integer providing the sequence of the *contained\_data\_element* *Data\_Element* within the *containing\_data\_element\_collection* *Data\_Element\_Collection*.

#### 5.1.3.1.2 Attribute of *Data\_Element\_Sequence* – *sequence\_number*

Attribute name: *sequence\_number*

Definition: integer providing the sequence of the *contained\_data\_element* *Data\_Element* within the *containing\_data\_element\_collection* *Data\_Element\_Collection*.

Obligation: Mandatory

Multiplicity: 1..1

Data type: Integer

— End of attribute of *Data\_Element\_Sequence* —

### 5.1.4 Associations in the Data Set metamodel region

#### 5.1.4.1 *data\_element\_collection\_hierarchy* association

The *data\_element\_collection\_hierarchy* association is a reflexive association which records the binding of zero or one *Data\_Element\_Collection* ([5.1.2.4](#)), the superset, to zero, one or more other *Data\_Element\_Collection*, the subset.

The association has two roles:

- *superset\_data\_element\_collection* (verb form: *superclass\_of*) which references a *Data\_Element\_Collection*.
- *subset\_data\_element\_collection* (verb form: *subclass\_of*) which references a *Data\_Element\_Collection*.

#### 5.1.4.2 *data\_set\_collection\_composition* association

The *data\_set\_collection\_composition* association is a reflexive association which records the binding of zero, one or more *Data\_Set\_Collections* ([5.1.2.6](#)), each of which is a partial data set collection, to zero or one *Data\_Set\_Collection*, the assembled data set collection.

The association has two roles:

- *assembled\_data\_set\_collection* (verb form: *comprised\_of*) which references a *Data\_Set\_Collection*.
- *partial\_data\_set\_collection* (verb form: *part\_of*) which references a *Data\_Set\_Collection*.

#### 5.1.4.3 *data\_set\_collection\_concept\_annotation* association

The *data\_set\_collection\_concept\_annotation* association records the binding of zero, one or more *Concepts* ([5.1.2.1](#)) to zero, one or more *Data\_Set\_Collections* ([5.1.2.6](#)).

The association has two roles:

- *concept\_annotated\_data\_set\_collection* (verb form: *annotation\_for*) which references a *Data\_Set\_Collection*.

- *concept\_annotation* (verb form: *annotated\_with*) which references a *Concept*.

#### 5.1.4.4 *data\_set\_collection\_context* association

The *data\_set\_collection\_context* association records the binding of zero, one or more *Context* (5.1.2.2) to zero, one or more *Data\_Set\_Collections* (5.1.2.6).

The association has two roles:

- *used\_data\_set\_collection* (verb form: *context\_for*) which references a *Data\_Set\_Collection*.
- *data\_set\_collection\_usage* (verb form: *used\_within*) which references a *Context*.

#### 5.1.4.5 *data\_set\_collection\_data\_set\_distribution* association

The *data\_set\_collection\_data\_set\_distribution* association records the binding of zero or one *Data\_Set\_Collection* (5.1.2.6) to zero, one or more *Data\_Set\_Distributions* (5.1.2.7).

The association has two roles:

- *distributed\_data\_set\_collection* (verb form: *for*) which references a *Data\_Set\_Distribution*.
- *data\_set\_collection\_distribution* (verb form: *distributed\_through*) which references a *Data\_Set\_Collection*.

#### 5.1.4.6 *data\_set\_collection\_provenance* association

The *data\_set\_collection\_provenance* association records the binding of zero, one or more *Data\_Set\_Provenance* (5.1.2.8) to zero or one *Data\_Set\_Collection* (5.1.2.6).

The association has two roles:

- *published\_data\_set\_collection* (verb form: *publication\_of*) which references a *Data\_Set\_Collection*.
- *publication\_record* (verb form: *published\_through*) which references a *Data\_Set\_Provenance*.

#### 5.1.4.7 *data\_set\_collection\_quality\_assessment* association

The *data\_set\_collection\_quality\_assessment* association records the binding of zero, one or more *Data\_Set\_Quality\_Assessment* (5.1.2.9) to zero or one *Data\_Set\_Collection* (5.1.2.6).

The association has two roles:

- *quality\_assessed\_data\_set\_collection* (verb form: *assessment\_for*) which references a *Data\_Set\_Collection*.
- *data\_set\_collection\_quality\_assessment* (verb form: *assessed\_with*) which references a *Data\_Set\_Quality\_Assessment*.

#### 5.1.4.8 *data\_set\_concept\_annotation* association

The *data\_set\_concept\_annotation* association records the binding of zero, one or more *Concepts* (5.1.2.1) to zero, one or more *Data\_Sets* (5.1.2.5).

The association has two roles:

- *concept\_annotated\_data\_set* (verb form: *annotation\_for*) which references a *Data\_Set*.
- *concept\_annotation* (verb form: *annotated\_with*) which references a *Concept*.

#### 5.1.4.9 data\_set\_context association

The *data\_set\_context* association records the binding of zero, one or more *Context* (5.1.2.2) to zero, one or more *Data\_Sets* (5.1.2.5).

The association has two roles:

- *used\_data\_set* (verb form: context\_for) which references a *Data\_Set*.
- *data\_set\_usage* (verb form: used\_within) which references a *Context*.

#### 5.1.4.10 data\_set\_data\_set\_collection association

The *data\_set\_data\_set\_collection* association records the binding of one or more *Data\_Sets* (5.1.2.5) to zero, one or more *Data\_Set\_Collections* (5.1.2.6).

The association has two roles:

- *included\_data\_set* (verb form: composed\_of) which references a *Data\_Set*.
- *containing\_collection* (verb form: part\_of) which references a *Data\_Set\_Collection*.

#### 5.1.4.11 data\_set\_data\_set\_distribution association

The *data\_set\_data\_set\_distribution* association records the binding of one and only one *Data\_Set* (5.1.2.5) to zero, one or more *Data\_Set\_Distributions* (5.1.2.7).

The association has two roles:

- *distributed\_data\_set* (verb form: for) which references a *Data\_Set*.
- *data\_set\_distribution* (verb form: distributed\_through) which references a *Data\_Set\_Distribution*.

#### 5.1.4.12 data\_set\_data\_set\_specification association

The *data\_set\_data\_set\_specification* association records the binding of zero, one or more *Data\_Sets* (5.1.2.5) to zero, one or more *Data\_Set\_Specifications* (5.1.2.10).

The association has two roles:

- *specified\_data\_set* (verb form: for) which references a *Data\_Set*.
- *data\_set\_specification* (verb form: specified\_with) which references a *Data\_Set\_Specification*.

#### 5.1.4.13 data\_set\_hierarchy association

The *data\_set\_hierarchy* association is a reflexive association which records the binding of zero or one *Data\_Sets* (5.1.2.5), each of which is a superset, to zero, one or more other *Data\_Sets*, each of which is a subset.

The association has two roles:

- *superset\_data\_set* (verb form: superclass\_of) which references a *Data\_Set*.
- *subset\_data\_set* (verb form: subclass\_of) which references a *Data\_Set*.

#### 5.1.4.14 data\_set\_provenance association

The *data\_set\_provenance* association records the binding of zero, one or more *Data\_Set\_Provenance* (5.1.2.8) to zero or one *Data\_Set* (5.1.2.5).



The association has two roles:

- *published\_data\_set* (verb form: *publication\_of*) which references a *Data\_Set*.
- *publication\_record* (verb form: *published\_through*) which references a *Data\_Set\_Provenance*.

#### 5.1.4.15 data\_set\_quality\_assessment association

The *data\_set\_quality\_assessment* association records the binding of zero, one or more *Data\_Set\_Quality\_Assessment* (5.1.2.9) to zero or one *Data\_Set* (5.1.2.5).

The association has two roles:

- *quality\_assessed\_data\_set* (verb form: *assessment\_for*) which references a *Data\_Set*.
- *data\_set\_quality\_assessment* (verb form: *assessed\_with*) which references a *Data\_Set\_Quality\_Assessment*.

#### 5.1.4.16 data\_set\_specification\_data\_element\_collection association

The *data\_set\_specification\_data\_element\_collection* association records the binding of zero, one or more *Data\_Set\_Specifications* (5.1.2.10) to zero, one or more *Data\_Element\_Collections* (5.1.2.4).

The association has two roles:

- *data\_element\_collection\_data\_set\_specification* (verb form: *part\_of*) which references a *Data\_Set\_Specification*.
- *partial\_data\_set\_specification* (verb form: *detailed\_by*) which references a *Data\_Element\_Collection*.

#### 5.1.4.17 data\_set\_specification\_information\_model association

The *data\_set\_specification\_information\_model* association records the binding of zero, one or more *Data\_Set\_Specifications* (5.1.2.10) to zero, one or more *Information\_Models* (5.1.2.11).

The association has two roles:

- *information\_model\_data\_set\_specification* (verb form: *part\_of*) which references a *Data\_Set\_Specification*.
- *partial\_data\_set\_specification* (verb form: *detailed\_by*) which references a *Information\_Model*.

#### 5.1.4.18 data\_set\_supersession association

The *data\_set\_supersession* association is a reflexive association which records the binding of zero or one *Data\_Sets* (5.1.2.5), the superseded data set, to zero or one other *Data\_Set*, the replacement data set.

The association has two roles:

- *superseded\_data\_set* (verb form: *superseded\_by*) which references a *Data\_Set*.
- *replacement\_data\_set* (verb form: *replacement\_for*) which references a *Data\_Set*.

#### 5.1.4.19 ordered\_data\_element\_collection\_data\_element association

The *ordered\_data\_element\_collection\_data\_element* association records the binding of zero, one or more *Ordered\_Data\_Element\_Collections* (5.1.2.12) to one or more *Data\_Elements* (5.1.2.3).

The association has two roles:

- *containing\_data\_element\_collection* (verb form: *within*) which references a *Data\_Element\_Collection*.

- *contained\_data\_element* (verb form: *part\_of*) which references a *Data\_Element*.

#### 5.1.4.20 *quality\_assessment\_context* association

The *quality\_assessment\_context* association records the binding of zero, one or more *Data\_Set\_Quality\_Assessments* (5.1.2.9) to zero or one *Context* (5.1.2.2).

The association has two roles:

- *contextualised\_quality\_assessment* (verb form: *specified\_within*) which references a *Data\_Set\_Quality\_Assessment*.
- *quality\_assessment\_context* (verb form: *context\_for*) which references a *Context*.

#### 5.1.4.21 *unordered\_data\_element\_collection\_data\_element* association

The *unordered\_data\_element\_collection\_data\_element* association records the binding of zero, one or more *Unordered\_Data\_Element\_Collections* (5.1.2.13) to one or more *Data\_Elements* (5.1.2.3).

The association has two roles:

- *containing\_data\_element\_collection* (verb form: *within*) which references an *Unordered\_Data\_Element\_Collection*.
- *contained\_data\_element* (verb form: *part\_of*) which references a *Data\_Element*.

## 6 Relationship to other parts of the ISO/IEC 11179 series

### 6.1 Relationship to ISO/IEC 11179-3

#### 6.1.1 General

This document provides a specification for an extension to a Metadata Registry (MDR), as specified in ISO/IEC 11179-3. This document extends the specification of ISO/IEC 11179-3 to provide for the registration of datasets. All of the provisions of ISO/IEC 11179-3 apply to this document.

#### 6.1.2 Use of the common facilities types specified in ISO/IEC 11179-3

Instances of each of the classes specified in this document shall be extended by one or more of the types specified in ISO/IEC 11179-3:2013, 5.5.

ISO/IEC 11179-3:2013, 5.5 specifies that the metamodel of a metadata registry allows a metadata item to simply be *identified* or to be both *identified* and *registered*. A *registered item* may either be an *administered item*, meaning it has its own *registration state*, or it may be an *attached item*, which means it is attached to an *administered item* and shares the latter's registration state.

ISO/IEC 11179-3:2013, 5.5 also allows any *metadata item* that is to be designated (named) and/or defined to be a *designatable item* and any *metadata item* that is to be classified in a *classification scheme* to be a *classifiable item*.

Listed below are the possible types for instances of the classes specified in this document.

- Instances of the following classes should be instances of *Administered\_Item*:
  - *Data\_Set*



- *Data\_Set\_Collection*
- Instances of the following classes should be instances of *Attached\_Item*:
  - *Data\_Element\_Collection*
  - *Ordered\_Data\_Element\_Collection*
  - *Unordered\_Data\_Element\_Collection*
  - *Data\_Element\_Sequence*
  - *Data\_Set\_Distribution*
  - *Data\_Set\_Specification*
  - *Data\_Set\_Provenance*
  - *Data\_Set\_Quality\_Assessment*
- Instances of *Data\_Set* and *Data\_Set\_Collection* might be instances of *Designatable\_Item*, allowing them to be defined and/or designated (named) and to be annotated with keywords and/or tags.
- Instances of any of the remaining classes might also be instances of *Designatable\_Item*, allowing them to be defined and/or designated (named).
- Instances of any of the classes might be instances of *Classifiable\_Item*, allowing them to be classified.

## 6.2 Relationship to ISO/IEC 11179-6

ISO/IEC 11179-6 describes the procedure by which *metadata items* required in various application areas could be assigned an internationally unique identifier and registered in a metadata registry maintained by one or more Registration Authorities.

The registration process described in ISO/IEC 11179-6 may be applied to any type of metadata item, including the information (metadata) about data sets.

Since this document provides one of the extensions to a Metadata Registry (as specified in ISO/IEC 11179-3:2013, Clauses 5 to 11) envisioned in ISO/IEC 11179-6:2015, 4.1, all of the requirements in ISO/IEC 11179-6 shall be followed.

## Annex A (informative)

### Alphabetical list of terms and designations

In [Table A.1](#), if the definition comes from [Clause 3](#) the item being defined is a general term. If the definition comes from [Clause 5](#) the item being defined is a construct within the metamodel.

**Table A.1 — Alphabetical list of terms**

Term/Designation	Defined in
access level	<a href="#">3.1.1</a>
access_level (attribute of <i>Data_Set</i> )	<a href="#">5.1.2.5.2.1</a>
access_level (attribute of <i>Data_Set_Collection</i> )	<a href="#">5.1.2.6.2.1</a>
access_level (attribute of <i>Data_Set_Distribution</i> )	<a href="#">5.1.2.7.2.6</a>
access_url (attribute of <i>Data_Set_Distribution</i> )	<a href="#">5.1.2.7.2.8</a>
accrual periodicity	<a href="#">3.1.2</a>
accrual_periodicity (attribute of <i>Data_Set</i> )	<a href="#">5.1.2.5.2.6</a>
category (attribute of <i>Data_Set_Quality_Assessment</i> )	<a href="#">5.1.2.9.2.3</a>
comments (attribute of <i>Data_Set</i> )	<a href="#">5.1.2.5.2.7</a>
comments (attribute of <i>Data_Set_Collection</i> )	<a href="#">5.1.2.6.2.4</a>
Concept (class)	<a href="#">5.1.2.1</a>
confidence_level (attribute of <i>Data_Set_Quality_Assessment</i> )	<a href="#">5.1.2.9.2.4</a>
Context (class)	<a href="#">5.1.2.2</a>
Data_Element (class)	<a href="#">5.1.2.3</a>
data element collection	<a href="#">3.1.3</a>
Data_Element_Collection (class)	<a href="#">5.1.2.4</a>
data_element_collection_hierarchy (association)	<a href="#">5.1.4.1</a>
Data_Element_Sequence (class)	<a href="#">5.1.3.1</a>
data set	<a href="#">3.1.4</a>
Data_Set (class)	<a href="#">5.1.2.5</a>
data set collection	<a href="#">3.1.5</a>
Data_Set_Collection (class)	<a href="#">5.1.2.6</a>
data_set_collection_composition (association)	<a href="#">5.1.4.2</a>
data_set_collection_concept_annotation (association)	<a href="#">5.1.4.3</a>
data_set_collection_context (association)	<a href="#">5.1.4.4</a>
data_set_collection_data_set_distribution (association)	<a href="#">5.1.4.5</a>
data_set_collection_provenance (association)	<a href="#">5.1.4.6</a>
data_set_collection_quality_assessment (association)	<a href="#">5.1.4.7</a>
data_set_concept_annotation (association)	<a href="#">5.1.4.8</a>
data_set_context (association)	<a href="#">5.1.4.9</a>
data_set_data_set_collection (association)	<a href="#">5.1.4.10</a>
data_set_data_set_distribution (association)	<a href="#">5.1.4.11</a>
data_set_data_set_specification (association)	<a href="#">5.1.4.12</a>

Table A.1 (continued)

Term/Designation	Defined in
data set distribution	<a href="#">3.1.6</a>
Data_Set_Distribution (class)	<a href="#">5.1.2.7</a>
data_set_hierarchy (association)	<a href="#">5.1.4.13</a>
Data_Set_Provenance (class)	<a href="#">5.1.2.8</a>
data_set_provenance (association)	<a href="#">5.1.4.14</a>
data_set_quality_assessment (association)	<a href="#">5.1.4.15</a>
Data_Set_Quality_Assessment (class)	<a href="#">5.1.2.9</a>
data set specification	<a href="#">3.1.7</a>
Data_Set_Specification (class)	<a href="#">5.1.2.10</a>
data_set_specification_data_element_collection (association)	<a href="#">5.1.4.16</a>
data_set_specification_information_model (association)	<a href="#">5.1.4.17</a>
data_set_supersession (association)	<a href="#">5.1.4.18</a>
distributor (attribute of <i>Data_Set_Distribution</i> )	<a href="#">5.1.2.7.2.1</a>
document_partial_description (attribute of <i>Data_Set_Specification</i> )	<a href="#">5.1.2.10.2</a>
download_url (attribute of <i>Data_Set_Distribution</i> )	<a href="#">5.1.2.7.2.9</a>
format (attribute of <i>Data_Set_Distribution</i> )	<a href="#">5.1.2.7.2.3</a>
generation_type (attribute of <i>Data_Set_Provenance</i> )	<a href="#">5.1.2.8.2.4</a>
information model	<a href="#">3.1.8</a>
Information_Model (class)	<a href="#">5.1.2.11</a>
issued_date (attribute of <i>Data_Set_Distribution</i> )	<a href="#">5.1.2.7.2.5</a>
issued_date (attribute of <i>Data_Set_Provenance</i> )	<a href="#">5.1.2.8.2.2</a>
media_type (attribute of <i>Data_Set_Distribution</i> )	<a href="#">5.1.2.7.2.2</a>
ontology	<a href="#">3.1.9</a>
Ordered_Data_Element_Collection (class)	<a href="#">5.1.2.12</a>
ordered_data_element_collection_data_element (association)	<a href="#">5.1.4.19</a>
originator (attribute of <i>Data_Set_Provenance</i> )	<a href="#">5.1.2.8.2.1</a>
originator (attribute of <i>Data_Set_Quality_Assessment</i> )	<a href="#">5.1.2.9.2.1</a>
ownership_statement (attribute of <i>Data_Set_Provenance</i> )	<a href="#">5.1.2.8.2.3</a>
provenance	<a href="#">3.1.10</a>
quality_assessment_context (association)	<a href="#">5.1.4.20</a>
quality_criteria (attribute of <i>Data_Set_Quality_Assessment</i> )	<a href="#">5.1.2.9.2.5</a>
rights	<a href="#">3.1.11</a>
rights (attribute of <i>Data_Set</i> )	<a href="#">5.1.2.5.2.2</a>
rights (attribute of <i>Data_Set_Collection</i> )	<a href="#">5.1.2.6.2.2</a>
rights (attribute of <i>Data_Set_Distribution</i> )	<a href="#">5.1.2.7.2.7</a>
sequence_number (attribute of <i>Data_Element_Sequence</i> )	<a href="#">5.1.3.1.2</a>
size (attribute of <i>Data_Set_Distribution</i> )	<a href="#">5.1.2.7.2.4</a>
spatial coverage	<a href="#">3.1.12</a>
spatial_coverage (attribute of <i>Data_Set</i> )	<a href="#">5.1.2.5.2.5</a>
spatial_coverage (attribute of <i>Data_Set_Collection</i> )	<a href="#">5.1.2.6.2.3</a>
statement (attribute of <i>Data_Set_Quality_Assessment</i> )	<a href="#">5.1.2.9.2.2</a>
temporal coverage	<a href="#">3.1.13</a>
temporal_coverage_end_date (attribute of <i>Data_Set</i> )	<a href="#">5.1.2.5.2.4</a>
temporal_coverage_start_date (attribute of <i>Data_Set</i> )	<a href="#">5.1.2.5.2.3</a>

**Table A.1** *(continued)*

Term/Designation	Defined in
Unordered_Data_Element_Collection (class)	<a href="#">5.1.2.13</a>
unordered_data_element_collection_data_element (association)	<a href="#">5.1.4.21</a>

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