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Geographic information — Data product specifications

Information géographique — Spécifications de contenu informationnel

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 19131 was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

Introduction

A data product specification is a detailed description of a dataset or dataset series together with additional information that will enable it to be created, supplied to and used by another party. It is a precise technical description of the data product in terms of the requirements that it will or may fulfil. However, the data product specification only defines how the dataset should be. For various reasons, compromises may need to be made in the implementation. The metadata associated with the product dataset should reflect how the product dataset actually is.

A data product specification may be created and used on different occasions, by different parties and for different reasons. It may, for example, be used for the original process of collecting data as well as for products derived from already existing data. It may be created by producers to specify their product or by users to state their requirements.

The purpose of this International Standard is to provide practical help in the creation of data product specifications, in conformance with other existing standards for geographic information. An aim is to produce a complete list of the items used to specify a data product.

This International Standard makes references to parts of existing standards. Some of the items used to specify the data in a data product can also be used as metadata for a resulting dataset with the same data product.

It is not necessary for a data product specification to specify the production process, but only the resulting data product. Nevertheless, it may include production and maintenance aspects if judged necessary to describe the data product.

This International Standard describes the content and structure of a data product specification. An example of a data product specification is presented in Annex F.

When an item for a data product specification is already defined in another standard of the ISO 19100 series, a reference to that document is explicitly made.

This International Standard is intended for use by producers, providers and potential users of data products.

Geographic information — Data product specifications

1   Scope

This International Standard describes requirements for the specification of geographic data products, based upon the concepts of other ISO 19100 International Standards. It also provides help in the creation of data product specifications, so that they are easily understood and fit for their intended purpose.

2   Conformance

Any data product specification claiming conformance with this International Standard shall pass all the requirements described in the abstract test suites in Annex A.

3   Normative references

The following referenced documents are indispensable for the application 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 639-2, *Code for the representation of names of languages — Part 2: Alpha-3 code*

ISO/TS 19103, *Geographic information — Conceptual schema language*

ISO 19107, *Geographic information — Spatial schema*

ISO 19108, *Geographic information — Temporal schema*

ISO 19109:2005, *Geographic information — Rules for application schema*

ISO 19110, *Geographic information — Methodology for feature cataloguing*

ISO 19111, *Geographic information — Spatial referencing by coordinates*

ISO 19112, *Geographic information — Spatial referencing by geographic identifiers*

ISO 19113, *Geographic information — Quality principles*

ISO 19115, *Geographic information — Metadata*

ISO 19117, *Geographic information — Portrayal*

ISO 19123, *Geographic information — Schema for coverage geometry and functions*

ISO/TS 19138, *Geographic information — Data quality measures*

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1
application
manipulation and processing of data in support of user requirements

[ISO 19101]

4.2
application schema
conceptual schema for data required by one or more **applications**

[ISO 19101]

4.3
conceptual model
model that defines concepts of a **universe of discourse**

[ISO 19101]

4.4
conceptual schema
formal description of a **conceptual model**

[ISO 19101]

4.5
coverage
feature that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal **domain**

[ISO 19123]

EXAMPLES   Raster image, polygon overlay, digital elevation matrix.

4.6
data product
dataset or **dataset series** that conforms to a **data product specification**

4.7
data product specification
detailed description of a **dataset** or **dataset series** together with additional information that will enable it to be created, supplied to and used by another party

NOTE   A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a dataset. It may be used for production, sales, end-use or other purposes.

4.8
dataset
identifiable collection of data

[ISO 19115]

NOTE   A dataset may 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 dataset. Theoretically, a dataset may be as small as a single feature or feature attribute contained within a larger dataset. A hardcopy map or chart may be considered a dataset.

4.9
dataset series
collection of **datasets** sharing the same product specification

[ISO 19115]

4.10
domain
well-defined set

[ISO/TS 19103]

NOTE   "Well-defined" means that the definition is both necessary and sufficient, as everything that satisfies the definition is in the set and everything that does not satisfy the definition is necessarily outside the set.

4.11
feature
abstraction of real-world phenomena

[ISO 19101]

NOTE   A feature may occur as a type or an instance. Feature type or feature instance shall be used when only one is meant.

4.12
feature association
relationship that links instances of one **feature** type with instances of the same or a different **feature** type

[ISO 19110]

NOTE 1   A feature association may occur as a type or an instance. Feature association type or feature association instance is used when only one is meant.

NOTE 2   Feature associations include aggregation of features.

4.13
feature attribute
characteristic of a **feature**

[ISO 19101]

NOTE 1   A feature attribute may occur as a type or an instance. Feature attribute type or feature attribute instance is used when only one is meant.

NOTE 2   A feature attribute type has a name, a data type and a domain associated with it. A feature attribute for a feature instance has an attribute value taken from the domain.

4.14
geographic data
data with implicit or explicit reference to a location relative to the Earth

[ISO 19109]

NOTE   Geographic information is also used as a term for information concerning phenomena implicitly or explicitly associated with a location relative to the Earth.

4.15
metadata
data about data

[ISO 19115]

4.16
model
abstraction of some aspects of reality

[ISO 19109]

4.17
portrayal
presentation of information to humans

[ISO 19117]

4.18
quality
totality of characteristics of a product that bear on its ability to satisfy stated and implied needs

[ISO 19101]

4.19
universe of discourse
view of the real or hypothetical world that includes everything of interest

[ISO 19101]

5   Symbols and abbreviated terms

5.1   Abbreviations

This International Standard adopts the following convention for presentation purposes:

UML   Unified Modeling Language.

5.2   UML notation

The diagrams that appear in this International Standard are presented using the Unified Modeling Language (UML) static structure diagram with the basic type definitions from ISO/TS 19103. The UML notations used in this International Standard are described in the Figures 1 and 2.
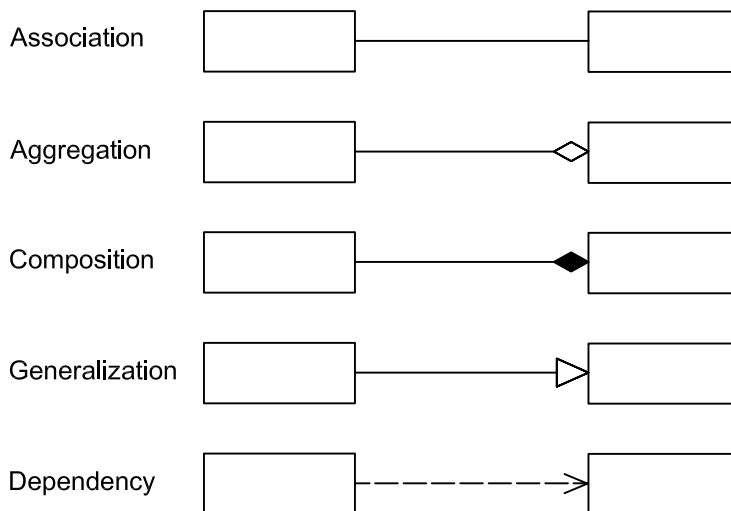
Figure 1 — UML notation

5.3 UML model relationships

If an association is navigable in a particular direction, the model has a "role name" that is appropriate for the role of the target object in relation to the source object. Thus, in a two-way association, two role names will be supplied. Figure 2 represents how role names and cardinalities are expressed in UML diagrams.
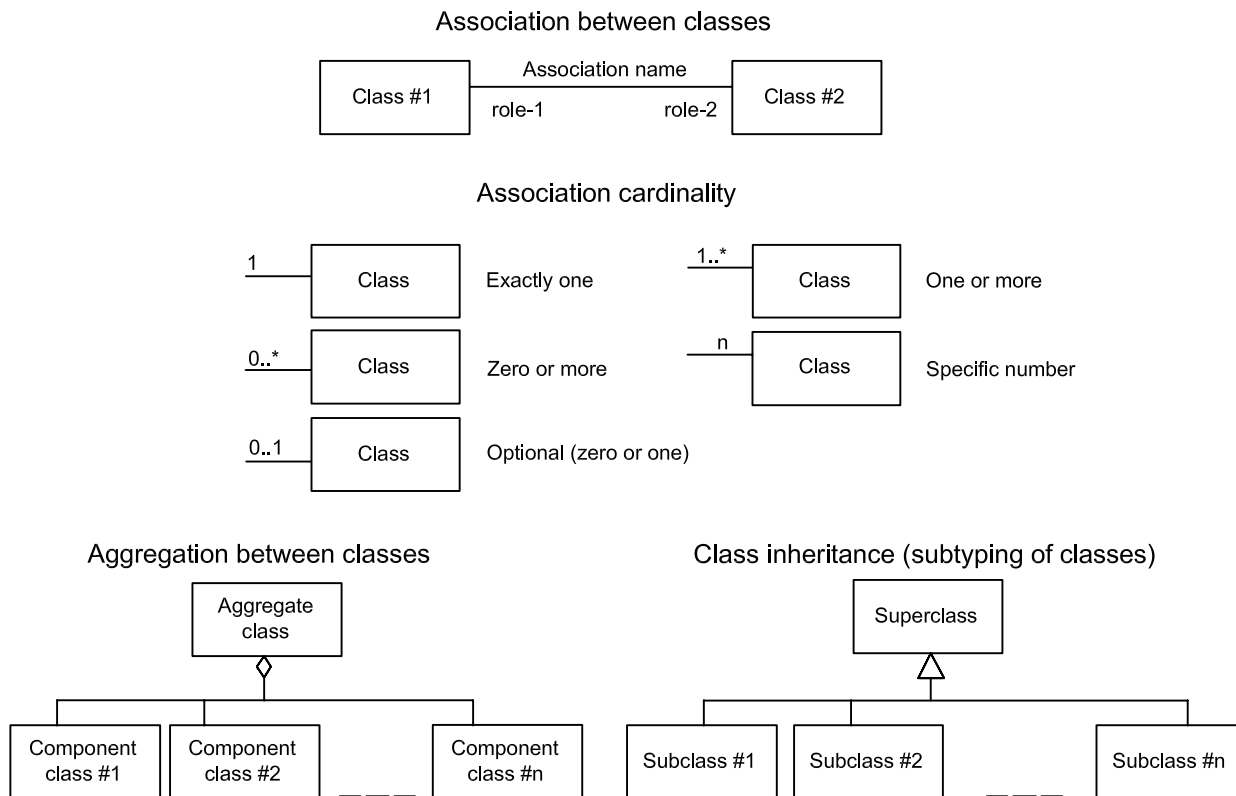
NOTE   Where cardinality is not explicitly stated in a diagram, it is assumed to be "exactly one".

Figure 2 — UML roles

5

5.4   UML model stereotypes

A UML stereotype is an extension mechanism for existing UML concepts. It is a model element that is used to classify (or mark) other UML elements so that they behave in some respect as if they were instances of new virtual or pseudo metamodel classes whose form is based on existing base metamodel classes. Stereotypes augment the classification mechanisms on the basis of the built-in UML metamodel class hierarchy. Below are brief descriptions of the stereotypes used in this International Standard. For more detailed descriptions consult ISO/TS 19103.

In this International Standard the following stereotype is used:

⎯   <<Leaf>> package that contains definitions, without any sub-packages.

5.5   Package abbreviations

Abbreviations are used to denote the package that contains a class. Those abbreviations precede class names, connected by a "_". The International Standard in which those classes are located is indicated in parentheses. A list of those abbreviations follows.

CI   Citation (ISO 19115)

CV   Coverages (ISO 19123)

DPS   Data product specification (this International Standard)

DQ   Data quality (ISO 19115)

EX   Extent (ISO 19115)

FC   Feature catalogue (ISO 19110)

GM   Geometry (ISO 19107)

MD   Metadata (ISO 19115)

TM   Temporal (ISO 19108)

6   General structure and content of a data product specification

A data product specification defines the requirements for a data product. It forms the basis for producing or acquiring data. It may also help potential users to evaluate the data product to determine its fitness for use by them. The information contained in a data product specification is different from that contained in metadata, which provides information about a particular physical dataset. Information from the data product specification may be used in the creation of metadata for a particular dataset that is created in conformance with that data product specification. Thus, metadata describes how a dataset actually is, whilst a data product specification describes how it should be. The requirements for metadata are described in ISO 19115. The relationship between a data product specification and metadata is described more fully in Annex B.

A data product specification shall contain major sections covering the following aspects of the data product:

⎯   Overview — see Clause 7;

⎯   Specification scopes — see Clause 8;

⎯   Data product identification — see Clause 9;

⎯   Data content and structure — see Clause 10;

— Reference systems — see Clause 11;

— Data quality — see Clause 12;

— Data product delivery — see Clause 16;

— Metadata — see Clause 18.

A data product specification may also contain sections covering the following aspects of the data product:

— Data capture — see Clause 13;

— Data maintenance — see Clause 14;

— Portrayal — see Clause 15;

— Additional information — see Clause 17.

Each of these sections of the data product specification is described in the following clauses. Each section, except for the overview (see Clause 7), which is human-readable free text, corresponds to a UML package. These packages are shown in Annex C.

The minimum description of a data product shall contain the mandatory elements within each section (see UML model and corresponding tables in Annexes D and E).

7 Overview

The overview shall include the following parts:

— information about the creation of the data product specification;

NOTE   This may include the title, a reference date, the responsible party, the language and the topic category.

— terms and definitions;

NOTE   This may take the form of a reference to a terminology repository.

— abbreviations;

— the name and any acronyms of the data product;

— an informal description of the data product.

The informal description of the data product shall contain general information about the data product which may include the following aspects:

— the content of the dataset;

— the extent (both spatial and temporal) of the data;

— the specific purpose for which the data shall be or has been collected;

— the data sources and data production processes;

— the maintenance of the data.

NOTE   An informal description is intended to give a short introduction to the data product specification and allow a human reader a better understanding of the specification.

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8   Specification scopes

The specification of a data product shall include a description of its scope, which may be restricted in terms of spatial or temporal extent, feature types and properties included, spatial representation, or position within a product hierarchy. The data product specification may specify a partitioning of the data content of the product on the basis of one or more criteria. Such partitioning may be different for different parts of the data product specification. Each such part of the data content shall be described by a specification scope that may inherit or override the general specification scope.

Criteria that might be used as the basis for partitioning include, but are not limited to

—   spatial or temporal extent,

—   feature type,

—   property type,

—   property value,

—   spatial representation,

—   product hierarchy.

EXAMPLE   Data products to support navigation often contain two sets of feature types: those that provide navigation information that changes rapidly and is essential for safety of navigation, and those that provide background reference information. Maintenance and delivery information would be partitioned on the basis of these groupings; reference system information would not.

The information describing the specification scope shall include scope identification and items from the following as required to describe the scope:

—   level — a code identifying the hierarchical level of the data;

—   level name — the name of the hierarchical level of the data;

—   level description — a detailed description of the level of the data;

—   extent — the spatial, vertical and temporal extent of the data;

—   coverage — the coverages to which the information applies.

A formal definition for specification scope information is given in Annex D which provides a UML model and the corresponding data definitions. The specification scope shall be identified by a Scope ID in the statement of that part of the specification.

9   Data product identification

The information identifying the data product shall include the following items:

—   title — the title of the data product;

—   abstract — a brief narrative summary of the content of the data product;

—   topic category — the main theme(s) of the data product;

—   geographic description — the extent of the geographic area covered by the data product.

The following optional items may be included where appropriate:

— alternate title — short name or other name by which the data product is known;

— purpose — summary of the intentions with which the data product is developed;

— spatial representation type — the form of the spatial representation (e.g. vector data);

— spatial resolution — a factor which provides a general understanding of the density of spatial data in the data product;

— supplemental information — any other descriptive information about the data product.

A formal definition for identification information is given in E.1 which provides a UML model and the corresponding data definitions.

10 Data content and structure

10.1 Feature-based data

The content information of a feature-based data product is described in terms of an application schema and a feature catalogue, and references to these and a narrative description shall be included in the specification.

An application schema provides the formal description of the data structure and content of the data product. It is a conceptual model described using a conceptual schema language such as UML. It shall include the representation of feature types, property types including attribute types, feature operations and feature associations, inheritance relations and constraints. Attribute types cover descriptive, geometric and temporal properties. Associations include spatial and temporal relationships such as topological relations as well as non-spatial relationships (e.g. ownership) that occur between feature types.

The elaboration of the application schema shall be in accordance with ISO 19109:2005, more specifically applying the rules in Clauses 7 and 8, and in particular those in the following subclauses of ISO 19109:2005:

— 8.3 when the application schema is created in UML;

— 8.5 when metadata has to be added on feature instances, feature attributes or associations between features (e.g. quality information);

— 8.6, Temporal rules, when describing temporal feature type properties;

— 8.7, Spatial rules, when describing spatial feature type properties with spatial data types;

— 8.9, Spatial referencing using geographic identifiers, when describing spatial feature type properties with geographic identifiers.

A feature catalogue is a repository which provides the semantics of all feature types, together with their attributes and attribute value domains, association types between feature types, and feature operations contained in the application schema. All the feature types, their attributes and attribute value domains, the association types between feature types, and feature operations expressed in the application schema shall be described in a feature catalogue.

The feature catalogue shall be realized according to ISO 19110. It may be included in the data product specification or may be externally referenced by the name of the feature catalogue. The data product specification shall include a description of each of the features in the data product. This shall include a reference to, or a description of, a feature and attribute catalogue as described in ISO 19110.

A formal definition for content and structure of feature-based data is given in E.2 which provides a UML model and the corresponding data definitions.

10.2 Coverage-based and imagery data

A coverage is considered a subtype of a feature. It behaves like a function which returns one or more feature attribute values from a direct position within a spatiotemporal domain. It can be derived from a collection of features that have common attributes. It associates a "range" to a "spatiotemporal domain." A "range" of a coverage is a set of attribute values which is associated with the elements of the spatiotemporal domain of that coverage. A spatiotemporal domain is a set of geometric objects described in terms of direct positions (spatial and/or temporal coordinates) within a bounded space and may be extended to all of the direct positions within the convex hull of that set of geometric objects. The spatiotemporal domain corresponds to the extent of the coverage. Coverage includes raster images (e.g. Landsat images), digital models for elevation, temperature, or precipitation, and polygon overlays (e.g. land use polygons, forest stand inventories, crop measurements). For example, an entire satellite image could be considered as the representation of a feature, that is, the "abstraction of real-world phenomena" as viewed by the sensor that produced the image. The image itself is usually represented as a simple grid consisting of a set of rows and columns providing organization to a set of pixels. Each pixel contains attribution data such the intensity — represented by a colour schema (e.g. RGB, HIS) within a colour space — seen at that point. Also, each pixel may contain an additional attribute that indicates the feature identifier associated with the pixel, so that the pixels corresponding to the image of a building are marked as the feature "building", and those corresponding to a road are marked as "road".

A data product specification shall identify each coverage and each image that is included within the specification and shall provide a narrative description for each. The content information for each coverage or image shall be described according to ISO 19123. Accordingly, the following components shall be identified to describe a coverage or an image:

— coverage/imagery identifier;

— coverage/imagery description;

— the coverage type;

— the specification of additional coverage information.

NOTE   The coverage type specifies the type of geometry used for this particular coverage and may be either a discrete coverage or a continuous coverage. Further information regarding the coverage may be specified as defined in ISO 19123.

A formal definition of data content and structure for coverage-based and imagery data is given in E.2, which provides a UML model and the corresponding data definitions.

11 Reference systems

The data product specification shall include information that defines the reference systems used in the data product. This shall include the following:

— the spatial reference system;

— the temporal reference system.

The spatial reference system used may be either a coordinate reference system, as defined in ISO 19111, or a spatial reference system using geographic identifiers, as defined in ISO 19112. The temporal reference system shall be as defined in ISO 19108. In either case, the reference system shall be identified by a reference system identifier.

A formal definition for reference system information is given in E.3, which provides a UML model and the corresponding data definitions.

12 Data quality

The data product specification shall identify the data quality requirements for the data product in accordance with ISO 19113. This shall include a statement on acceptable conformance quality levels and corresponding data quality measures as defined in ISO/TS 19138. This statement shall cover all the data quality elements and data quality sub-elements defined in ISO 19113, even if only to state that a specific data quality element or data quality sub-element is not applicable. It shall also include any additional data quality elements and sub-elements.

A formal definition of data quality information is given in E.4, which provides a UML model and the corresponding data definitions. It shall be repeated as many times as the number of different specification scopes in the data product and shall be recorded as described in ISO 19115.

When establishing the conformance quality levels in a data product specification, it should be taken into consideration that

— different quality evaluation methods may be applied to different parts of the dataset (different data quality scopes),

— for the same data quality element, different results with different confidence intervals can be achieved with different quality evaluation measures,

— conformance quality levels can be different for different features in the dataset, e.g. the required positional accuracy for features with fuzzy boundaries is usually much lower than for linear and well-defined features.

13 Data capture

The data product specification may provide information on how the data is captured. Where this section of the data product specification is included, it shall contain a data capture statement which shall be a general description of the sources and the processes to be used. It may allow freedom of choice for the data capture process or may specify one particular data capture process. Conformance quality levels may need to be given for intermediate data which may be required for the production of the data. A formal definition for data capture information is given in E.5, which provides a UML model and the corresponding data definitions.

14 Data maintenance

The data product specification may provide information on how the data is maintained. Where this section of the data product specification is included, it shall describe the principles and criteria applied in the maintenance of the data once it has been captured. This shall include the maintenance and update frequency which shall describe the frequency with which changes and additions are made to the data product. A formal definition for data maintenance information is given in E.6, which provides a UML model and the corresponding data definitions.

15 Portrayal

The data product specification may provide information on how the data held within the dataset is to be presented as graphic output, as a plot or as an image. Where included, this shall take the form of a reference to a set of portrayal rules and a set of portrayal specifications. A formal definition of portrayal information is given in E.7, which provides a UML model and the corresponding data definitions.

The portrayal catalogue shall be defined in accordance with ISO 19117.

16 Data product delivery

The data product specification shall identify any requirements for the data product delivery. These shall include delivery format information and delivery medium information, where applicable.

Delivery format information may include the following items:

— name of the data format;

— version of the format (date, number, etc);

— the name of the subset, profile or product specification of the format;

— structure of the delivery file;

— language(s) used within the dataset;

— the full name of the character-coding standard used.

Delivery medium information may include the following items:

— description of the units of delivery (e.g. tiles, layer, geographic areas);

— estimated size of a unit in the specified format, expressed in Mbytes;

— name of the data medium;

— other delivery information.

A formal definition for data product delivery information is given in E.8, which provides a UML model and the corresponding data definitions.

17 Additional information

This section of the data product specification may include any other aspects of the data product not provided elsewhere in this International Standard. A formal definition for additional information is given in E.9, which provides a UML model and the corresponding data definitions. This might include constraint information (for access and use). If this information only applies to part of the product, then the scope for this must be clearly identified.

18 Metadata

The core metadata elements as defined in ISO 19115 shall be included with the data product. Any additional metadata items that need to be supplied shall be stated in the data product specification. The format and encoding of the metadata shall be stated in the data product specification.

Annex A
(normative)

Abstract test suite

A.1 Data product specification sections

a) Test purpose: Verify that all the mandatory sections are included in the data product specification.

b) Test method: Inspect all sections in the data product specification to verify that they are included.

c) Reference: Clause 6.

d) Test type: Basic.

A.2 Mandatory items

a) Test purpose: Verify that for each section of the data product specification, all the mandatory items of the standard are included in the data product specification.

b) Test method: Inspect each section of the data product specification to verify that all the mandatory items are present.

c) Reference: Clauses 7-18.

d) Test type: Basic.

A.3 Item details

a) Test purpose: Verify that each item is in the correct form.

b) Test method: Inspect all items in the data product specification to verify that they are in the correct form.

c) Reference: Annexes D and E.

d) Test type: Basic.

Annex B
(informative)

Relationship between data product specification and metadata

ISO 19115 provides a structure for describing digital geographic data. It defines metadata elements, provides a schema and establishes a common set of metadata terminology, definitions and extension procedures. This International Standard uses part of the same schema.

To ensure the smooth transition of information elements from the data product specification to metadata, the mapping of the concepts is vital. Whilst metadata documents how data really is, the data product specification documents how the data should be, focusing on the requirements. These requirements are the basis for producing data, but also for some users to evaluate if the product is suitable for their requirements. The data product specification may be created before the data product. Many of the elements of the data product specification will be used to document the metadata of the resulting dataset. Figure B.1 explains this relationship, showing how the data product specification specifies the data product which is implemented as a dataset which in turn is described by metadata.
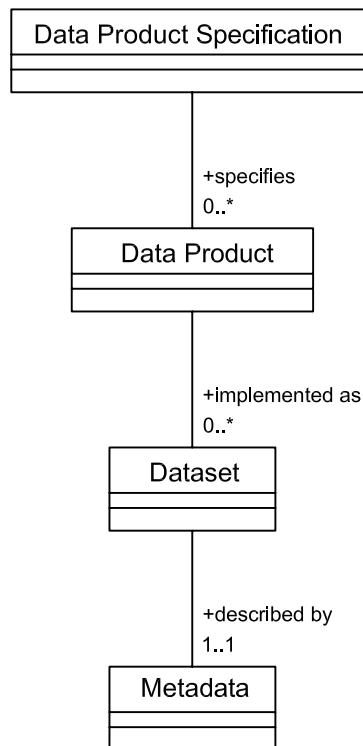
Figure B.1 — Relationship between data product specification and metadata

NOTE   Figure B.1 is illustrative and does not form part of the UML specification for a data product specification.

Annex C
(informative)

UML packages

The model for a data product specification (DPS) is described as a set of packages. Each package contains one or more entities (UML classes) which can be specified (subclassed) or generalized (superclassed). Entities contain elements (UML class attributes) which identify the discrete units applicable to describing a data product specification. Figure C.1 illustrates the layout of the packages. A data product is fully specified in the UML model diagrams and partially specified in the data dictionary for each package which can be found in Annexes D and E.

Figure C.1 — Data product specification packages

Annex D
(normative)

Data product specification scopes

Figure D.1 shows the UML model for the data specification scope and how it relates to the other packages in the data product specification. Tables D.1 and D.2 show the corresponding data definitions.
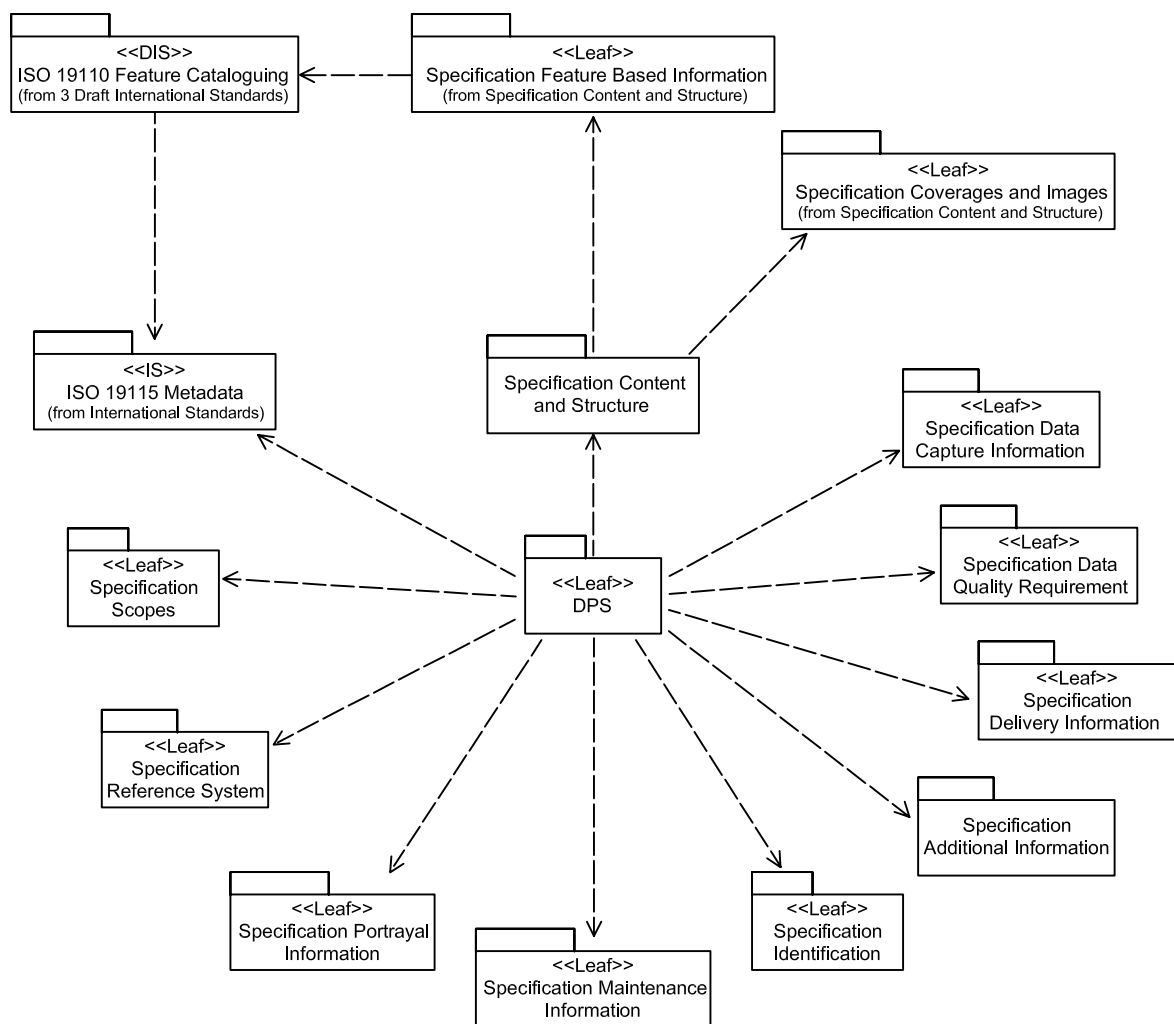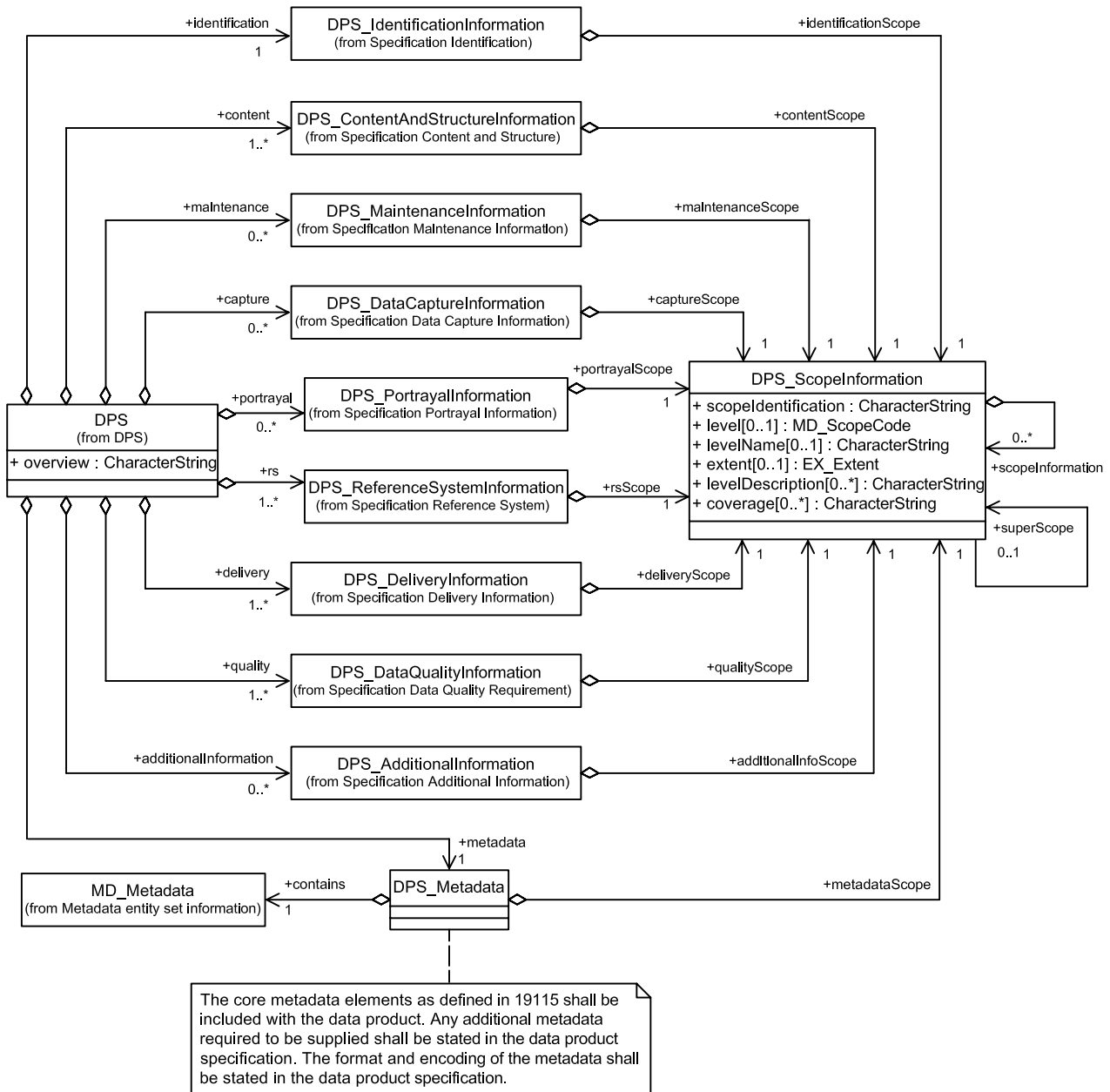

Figure D.1 — UML model for data product specification

Table D.1 shows the corresponding data definition for the class DPS, the data product specification. Table D.2 shows the data definition for the class DPS_ScopeInformation, the data product specification scope. The data definitions for the constituent data product packages are given in Annex E.

Table D.1 — DPS

	Item name	Definition	Obligation/ condition	Multiplicity	Data type	Domain
1	overview	general information about the product specification	M	1	Character String	free text
2	role: identification	identification information for the DPS	M	1	DPS_IdentificationInformation	see E.1
3	role: capture	capture information for the DPS	O	N	DPS_DataCaptureInformation	see E.5
4	role: quality	quality information for the DPS	M	N	DPS_DataQualityInformation	see E.4
5	role: maintenance	maintenance information for the DPS	O	N	DPS_MaintenanceInformation	see E.6
6	role: portrayal	portrayal information for the DPS	O	N	DPS_PortrayalInformation	see E.7
7	role: rs	reference system information for the DPS	M	N	DPS_ReferenceSystemInformation	see E.3
8	role: delivery	delivery information	M	N	DPS_DeliveryInformation	see E.8
9	role: additionalInformation	additional information for the DPS	O	N	DPS_AdditionalInformation	see E.9
10	role: metadata	metadata information for the DPS	M	N	DPS_Metadata	see ISO 19115
11	role: content	content information for the DPS	M	N	DPS_ContentAndStructureInformation	see E.2

Table D.2 — The scope information for the aspect of the data product specification

	Item name	Definition	Obligation/ condition	Multiplicity	Data type	Domain
1	scopeIdentification	identification of the scope for the purpose of a particular data specification	M	1	CharacterString	free text
2	level	hierarchical level of the data specified by the scope	O	1	MD_ScopeCode	see ISO 19115
3	levelName	name of the hierarchy level of the data specified by the scope	O	1	CharacterString	free text
4	extent	information about the spatial, vertical and temporal extent of the data specified by the scope	O	1	EX_Extent	see ISO 19115
5	levelDescription	detailed description about the level of the data specified by the scope	O	N	CharacterString	free text
6	coverage	coverages to which the information applies	O	N	CharacterString	free text
7	role: scopeInformation	scopes that are part of this scope	O	N	DPS_ScopeInformation	aggregation of scopes
8	role: superScope	parent scope of this scope	O	1	DPS_ScopeInformation	a higher level scope

Annex E
(normative)

Data product specification contents

E.1 Identification information

Figure E.1 shows the UML model for the data product identification information. Table E.1 shows the corresponding data definition.
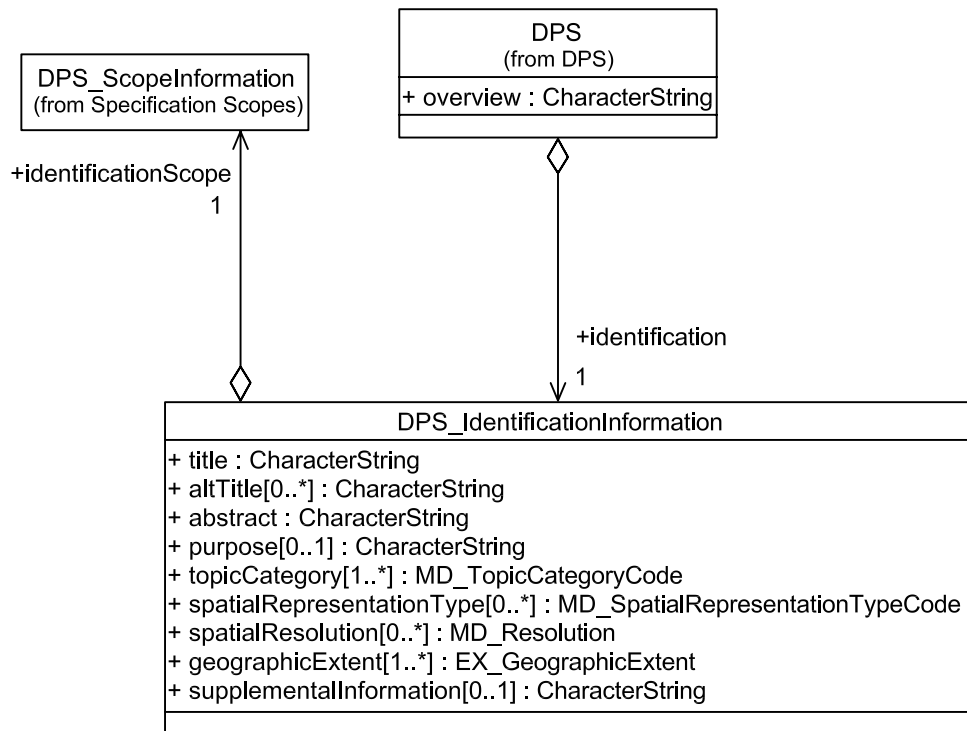

Figure E.1 — UML model for identification information

Table E.1 — Identification information

	Item name	Definition	Obligation/ Condition	Maximum occurrence	Data type	Domain
1	title	title of data product	M	1	CharacterString	free text
2	altTitle	other name by which the data product is known	O	N	CharacterString	free text
3	abstract	brief narrative summary of the content of the data product	M	1	CharacterString	free text
4	purpose	summary of the intentions with which the data product is developed	O	1	CharacterString	free text
5	topicCategory	main theme(s) of the dataset	M	N	MD_TopicCategoryCode <<CodeList>>	see ISO 19115
6	spatialRepresentationType	form of spatial representation	O	N	MD_Spatial RepresentationTypeCode	see ISO 19115
7	spatialResolution	factor which provides a general understanding of the density of spatial data in the dataset	O	N	MD_Resolution <<Union>>	see ISO 19115
8	geographicExtent	description of the geographic area within which data is available	M	N	EX_GeographicExtent	see ISO 19115
9	supplementalInformation	any other descriptive information about the dataset	O	1	CharacterString	free text
10	role: identificationScope	scope of the identification information	M	1	DPS_ScopeInformation	see Annex D

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E.2 Data content and structure information

Figure E.2 shows the UML model for data content and structure information. Tables E.2 to E.4 provide the corresponding data definitions.
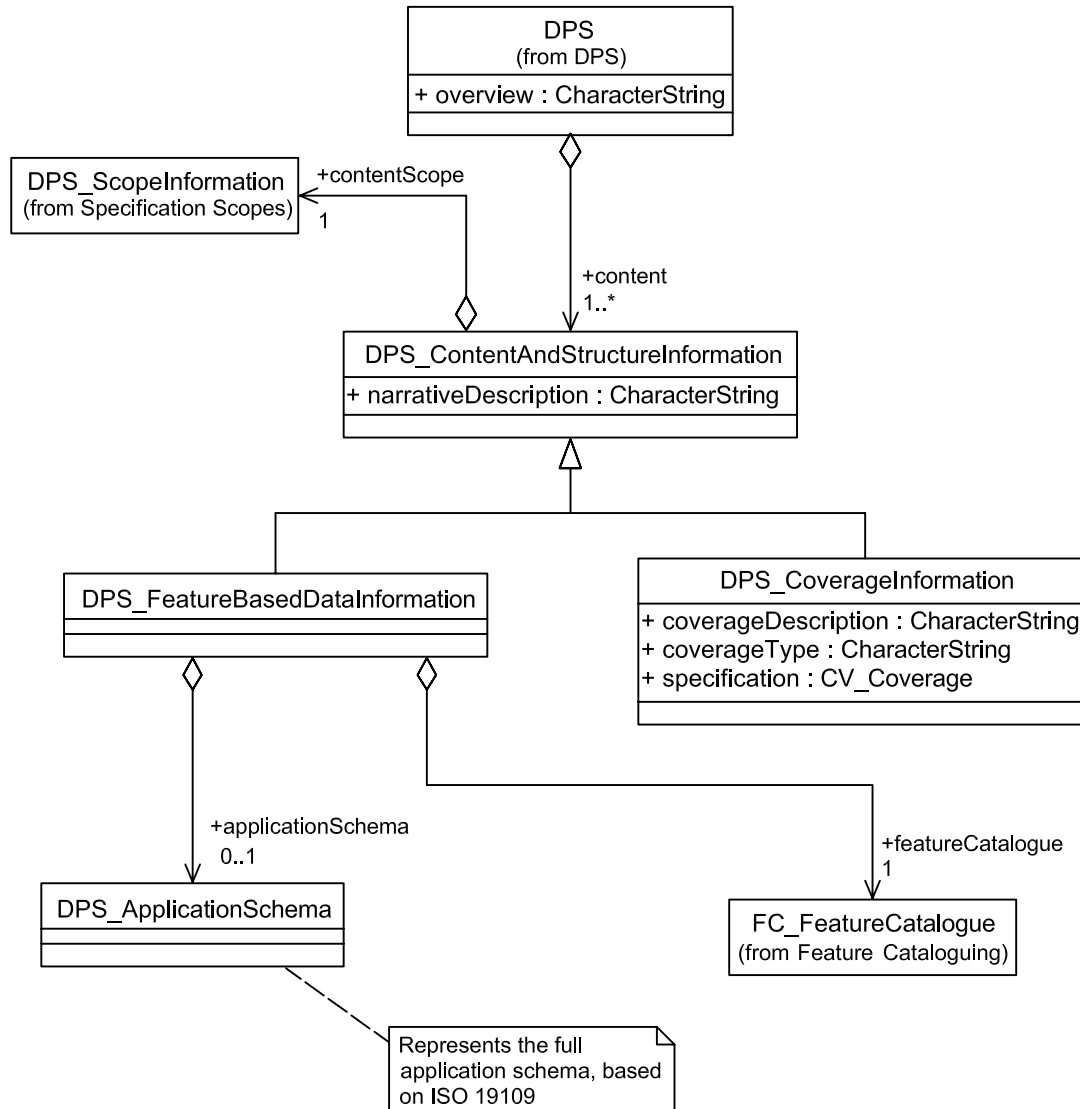
Figure E.2 — Content and structure information

Table E.2 — Content and structure information

	Item name	Definition	Obligation	Maximum occurrence	Data type	Domain
1	narrativeDescription	unique identifier of coverage	M	1	CharacterString	free text
2	role: identificationScope	scope of the identification information	M	1	DPS_ScopeInformation	see Annex D

Table E.3 — Feature-based information

	Item name	Definition	Obligation	Maximum occurrence	Data type	Domain
1	role: applicationSchema	the application schema	O	1	DPS_ApplicationSchema	see ISO 19109
2	role: featureCatalogue	the feature catalogue	M	1	FC_FeatureCatalogue	see ISO 19110

Table E.4 — Coverage information

	Item name	Definition	Obligation	Maximum occurrence	Data type	Domain
1	coverageDescription	technical description of the coverage	M	1	CharacterString	Free text
2	coverageType	type of coverage	M	1	CharacterString	Free text
3	specification	additional coverage information	M	1	CV_Coverage	See ISO 19123

E.3 Reference system information

Figure E.3 shows the UML model for reference system information. Table E.5 provides the corresponding data definitions.
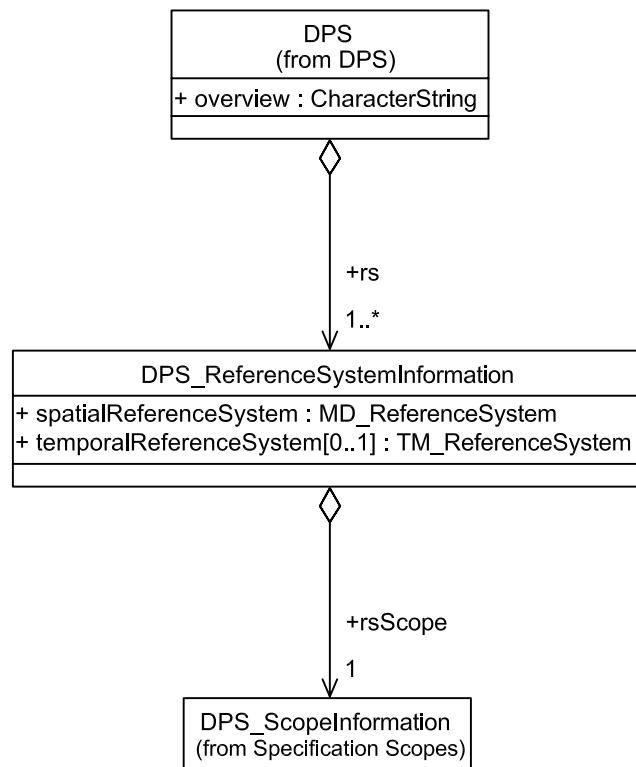

Figure E.3 — UML model for reference system information

Table E.5 — Reference system identification

	Item name	Definition	Obligation/ condition	Maximum occurrence	Data type	Domain
1	spatialReferenceSystem	identifier of spatial reference system	M	1	MD_ReferenceSystem	see ISO 19115
2	temporalReferenceSystem	identifier of temporal reference system	O	1	TM_ReferenceSystem	see ISO 19108
3	role: rsScope	scope for the reference system information	M	1	DPS_ScopeInformation	see Annex D
NOTE The class MD_ReferenceSystem is used here as a generalization of SC_CRS (from ISO 19111) and SI_SpatialReferenceSystem-UsingGeographicIdentifiers (from ISO 19112).						

E.4 Data quality information

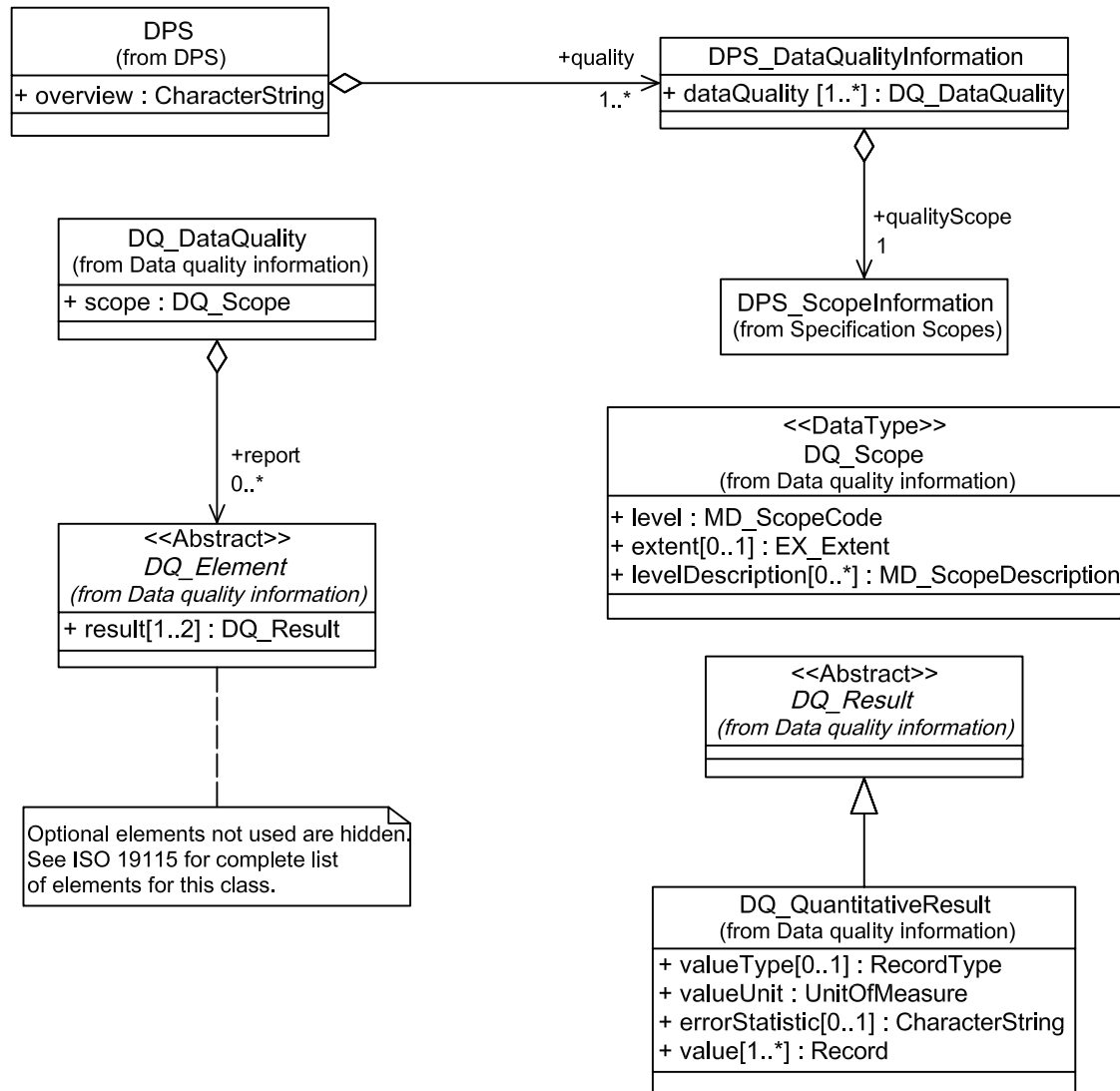Figure E.4 shows the UML model for data quality information. Table E.6 provides the corresponding data definitions.

Figure E.4 — UML diagram for data quality

Table E.6 — Data quality element requirement information

	Item name	Definition	Obligation	Maximum occurrence	Data type	Domain
1	dataQuality	required level of data quality	M	N	DQ_DataQuality	see ISO 19115
2	role: qualityScope	scope for the quality information	M	1	DPS_ScopeInformation	see Annex D

E.5 Data capture information

Figure E.5 shows the UML model for data capture information. Table E.7 provides the corresponding data definitions.
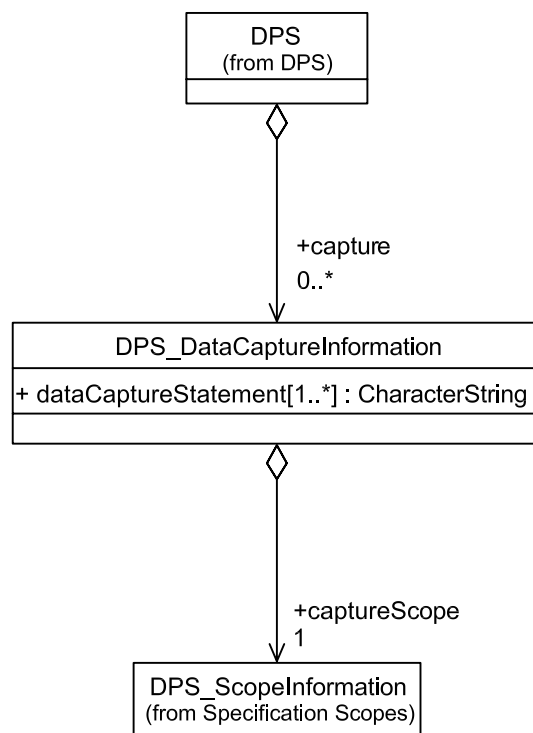
Figure E.5 — UML model for data capture information

Table E.7 — Data capture information

	Item name	Definition	Obligation	Maximum occurrence	Data type	Domain
1	dataCaptureStatement	general description of the process for the capture of the data	M	N	CharacterString	free text
2	role: captureScope	scope for the data capture information	M	1	DPS_ScopeInformation	see Annex D

Not for Resale

E.6 Data maintenance information

Figure E.6 shows the UML model for maintenance information. Table E.8 provides the corresponding data definitions.
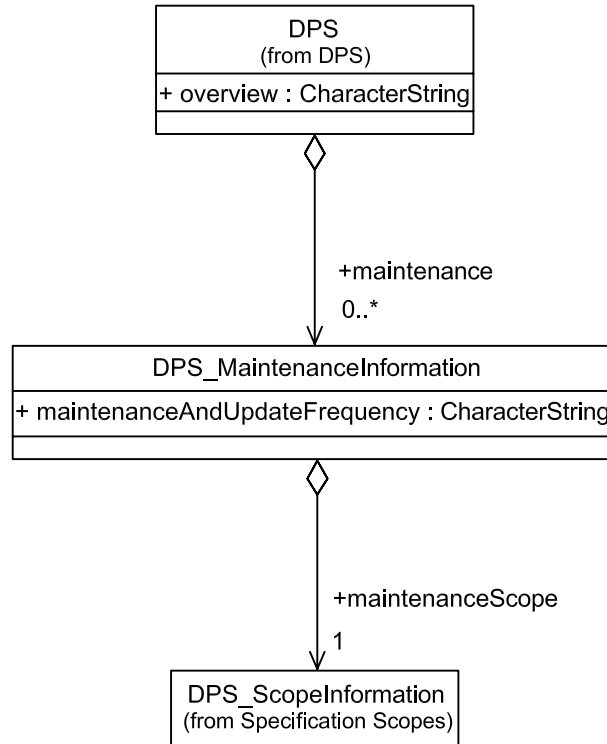
Figure E.6 — UML model for maintenance

Table E.8 — Maintenance information

	Item name	Definition	Obligation	Maximum occurrence	Data type	Domain
1	maintenanceAndUpdateFrequency	frequency with which changes and additions are made to the product	M	1	CharacterString	free text
2	role: maintenanceScope	scope for the data capture information	M	1	DPS_ScopeInformation	see Annex D

E.7 Portrayal information

Figure E.7 shows the UML model for portrayal information. Table E.9 provides the corresponding data definitions.
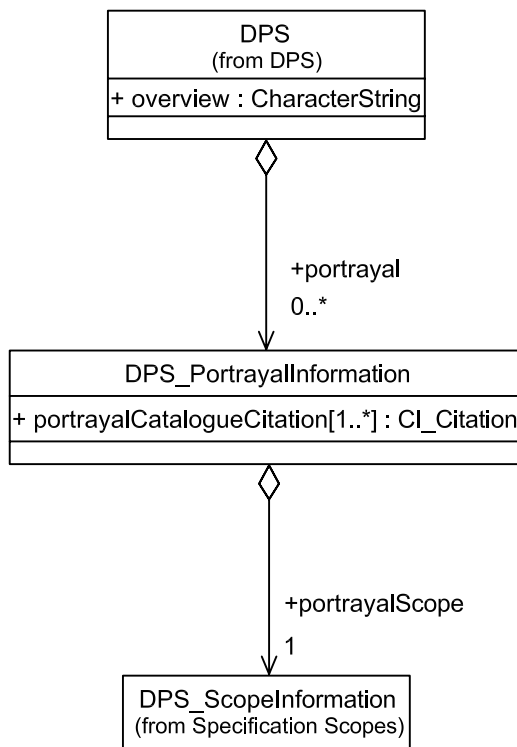
Figure E.7 — UML model for portrayal information

Table E.9 — Portrayal information

	Item name	Definition	Obligation	Maximum occurrence	Data type	Domain
1	portrayalCatalogueCitation	bibliographic reference to the portrayal catalogue	M	N	CI_Citation	see ISO 19115
2	role: portrayalScope	scope for the portrayal information	M	1	DPS_ScopeInformation	see Annex D

E.8 Delivery information

Figure E.8 shows the UML model for delivery information. Tables E.10, E.11 and E.12 provide the corresponding data definitions.
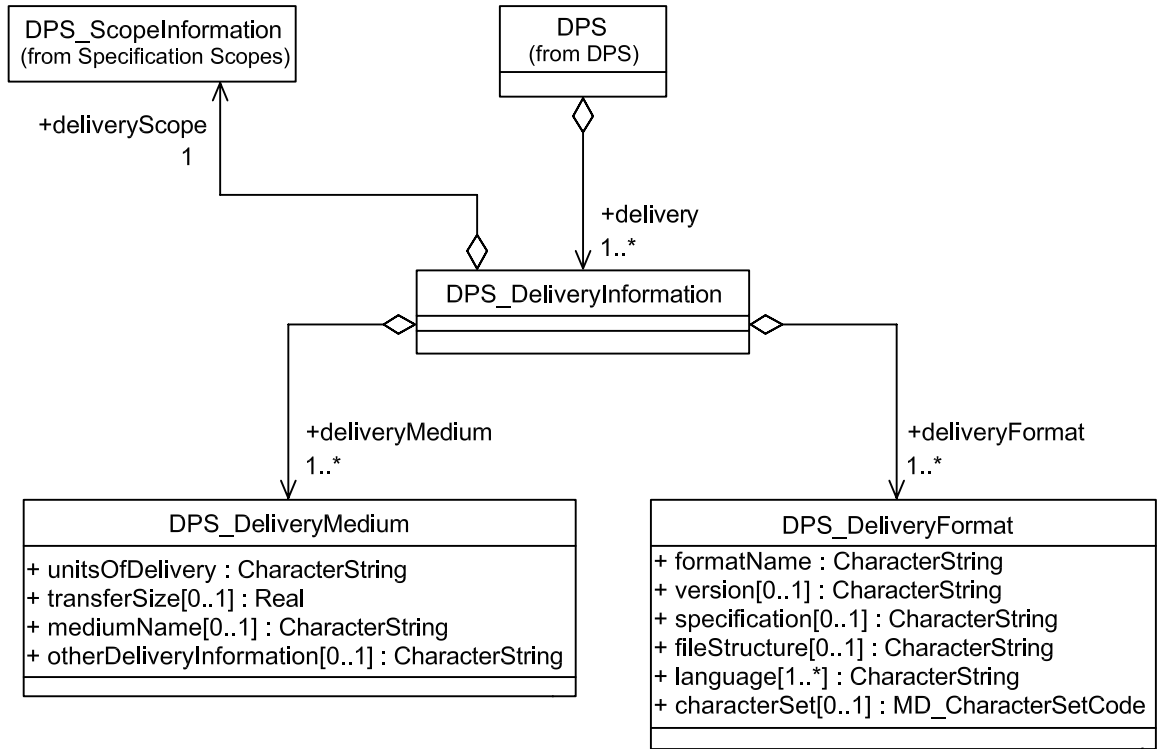
Figure E.8 — UML model for delivery information

Table E.10 — Delivery format information

	Item name	Definition	Obligation	Maximum occurrence	Data type	Domain
1	deliveryMedium	medium in which the product is delivered	M	N	DPS_DeliveryMedium	see Table E.9.1
2	deliveryFormat	format in which the product is delivered	M	N	DPS_DeliveryFormat	see Table E.9.2
3	role: deliveryScope	scope for the delivery information	M	1	DPS_ScopeInformation	see Annex D

Table E.11 — Delivery format information

	Item name	Definition	Obligation/ condition	Maximum occurrence	Data type	Domain
1	formatName	name of the data format	M	1	CharacterString	free text
2	version	version of the format (date, number, etc)	O	1	CharacterString	free text
3	specification	name of a subset, profile, or product specification of the format	O	1	CharacterString	free text
4	fileStructure	structure of delivery file	O	1	CharacterString	free text
5	language	language(s) used within the dataset	M	N	CharacterString	ISO 639-2, other parts may be used
6	characterSet	full name of the character coding standard used for the dataset		1	MD_CharacterSetCode	See ISO 19115

Table E.12 — Delivery medium information

	Item name	Definition	Obligation/ condition	Maximum occurrence	Data type	Domain
1	unitsOfDelivery	description of the units of delivery (e.g. tiles, layers, geographic areas)	M	1	CharacterString	free text
2	transferSize	estimated size of a unit in the specified format, expressed in Mbytes	O	1	Real	>0
3	mediumName	name of the data medium	O	1	CharacterString	free text
4	otherDeliveryInformation	other information about the delivery	O	1	CharacterString	free text

E.9 Additional information

Figure E.9 shows the UML model for additional information. Table E.13 provides the corresponding data definitions.
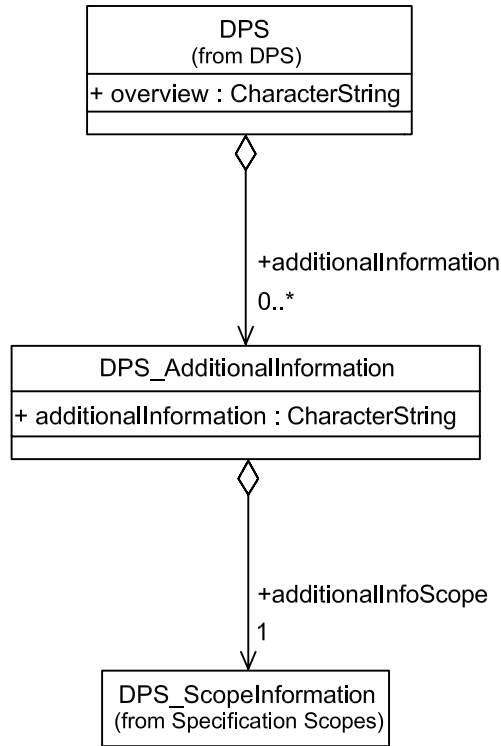
Figure E.9 — UML model for additional information

Table E.13 — Additional information

	Item name	Definition	Obligation/ condition	Maximum occurrence	Data type	Domain
1	additionalInformation	other aspects of the data product not provided elsewhere in the specification	O	1	CharacterString	free text
2	role: additionalInfoScope	scope for the additional information	M	1	DPS_ScopeInformation	see Annex D

Annex F
(informative)

Example of a data product specification

F.1 Overview

Information about the creation of the data product specification (DPS)

DPS title: National Road Network, Canada, Level 1 – an ISO 19131 example

DPS reference date: January 10, 2003

DPS responsible party: Natural Resources Canada
Centre for Topographic Information
2144, King Street West, Suite 010
Sherbrooke (Quebec) Canada J1J 2E8
Phone: +01-819-564-5600
            1-800-661-2638 (Canada and USA)
Fax: +01-819-564-5698
E-mail: geobase@nrcan.gc.ca
URL: http://www.geobase.ca

DPS language: English, French

DPS topic category: 018 –Transportation/road network and vector data

DPS distribution format: PDF

Terms and definitions

Feature attribute
characteristic of a feature

NOTE   For example, number of lanes or pavement status.

Class
description of a set of objects that share the same attributes, operations, methods, relationships, and semantics [UML Semantics]

NOTE   A class does not always have an associated geometry (e.g. the metadata class).

Event
characteristic of a feature measured along a road object without modifying the associated geometry

Feature
abstraction of real world phenomena

Object
entity with a well-defined boundary and identity that encapsulates state and behaviour [UML Semantics]

NOTE   An object is an instance of a class.

Package
grouping of a set of classes, relationships, and even other packages with a view to organizing the model into more abstract structures

Linear referencing system
a means of identifying a location by reference to a segment of a linear geographic feature (such as a roadway) and a distance from some point along that segment

Abbreviations

CTIS: Centre for Topographic Information Sherbrooke

GDF: Geographic Data Files

ID: Identifier

NID: National Identifier

NRCan: Natural Resources Canada

NRNC1: National Road Network, Canada, Level 1

NTDB: National Topographic Data Base

UML: Unified Modelling Language

UUID: Universal Unique Identifiers

Name and acronyms of the data product

National Road Network, Canada, Level 1 – an ISO19131 example
NRNC1/ISO19131ex

Informal description of the data product

NRNC1/ISO19131ex focuses on providing a quality geometric description and a set of basic attributes of Canadian road phenomena. The first release of the *NRNC1/ISO19131ex* product will not include resource/recreation roads. *NRNC1/ISO19131ex* data will be revised on a regular basis. Geographic Data Files (GDF) V4 from ISO/TC 204 were used as a guideline for this model. The *NRNC1/ISO19131ex* product strives to comply, to the degree possible, with GDF vocabulary (class names, attribute names and definitions).

Unique Identifiers are associated with each geometric and event object. These IDs (called National Identifiers – NIDs) will lead to more efficient management of updates between data producers and data users.

The Centre for Topographic Information - Sherbrooke (CTIS), part of Natural Resources Canada (NRCan), produced the first version of the *NRNC1/ISO19131ex*. CTIS continues to pursue its goal of capturing and managing *NRNC1/ISO19131ex* data within a network of partners. These partner organizations are selected for their specific interests or for their ease in offering adequate, up-to-date representations of road phenomena. These data must be the product of a homogenous, standardized view of the entire Canadian landmass.

The data model can (and must) extend beyond the smallest common denominator obtained with the partners. The model must therefore contain two levels of information: mandatory data and optional data. Data homogeneity will thereby be ensured by a minimum set of data. Beyond the minimum level, the model serves as a target for all partners. Over the years, we will therefore work towards raising the minimum and redefining new targets. Minimum content has been defined for attributive and geometric data.

The *NRNC1/ISO19131ex* data will serve as a foundation for several applications. This common geometric base will be maintained closest to the source and used by all who participate. This common infrastructure should facilitate data integration with supplementary data.

The available output file formats for the product are GML (Geography Markup Language) in ASCII and SHAPE (ESRI™).

F.2 Specification scope (DPS_ScopeInformation)

This clause defines only one general scope, which applies to each part of this data product specification.

Scope identification
(DPS_ScopeInformation.scopeIdentification) rootScope

Level
(DPS_ScopeInformation.level > MD_ScopeCode) 006 – series

Level name
(DPS_ScopeInformation.levelName) NRN general scope

Extent
(DPS_ScopeInformation.extent > EX_Extent.description) Canada's landmass

Level description
(DPS_ScopeInformation.levelDescription) root level in the scope level hierarchy

F.3 Data product identification (DPS_IdentificationInformation)

Title
(DPS_IdentificationInformation.title) National Road Network, Canada, Level 1 – an ISO19131 example

Alternate title
(DPS_IdentificationInformation.alternateTitle) NRNC1/ISO19131ex

Abstract
(DPS_IdentificationInformation.abstract) The National Road Network, Canada, Level 1 – an ISO 19131 example focuses on providing a quality geometric description and a set of basic attributes of Canadian road phenomena. The first release of the *NRNC1/ISO19131ex* product will not include resource/recreation roads. *NRNC1/ISO19131ex* data will be revised on a regular basis. Geographic Data Files (GDF) V4 from ISO/TC 204 were used as a guideline for this model. The *NRNC1/ISO19131ex* product strives to comply, to the degree possible, with GDF vocabulary (class names, attribute names and definitions).

Purpose
(DPS_IdentificationInformation.purpose) The *NRNC1/ISO19131ex* data will serve as a foundation for several applications. This common geometric base will be maintained closest to the source and used by all who participate. This common infrastructure should facilitate data integration with supplementary data.

Topic category
(DPS_IdentificationInformation.topicCategory > MD_TopicCategoryCode) 018 – transportation/road network and vector data

Spatial resolution
(DPS_IdentificationInformation.spatialResolution > MD_Resolution.equivalentScale > MD_RepresentativeFraction.denominator) 10 000

Geographic description

(DPS_IdentificationInformation.geographicDescription >
EX_GeographicDescription.geographicIdentifier > MD_Identifier.authority > CI_Citation.title) ISO 3166-1:1997
Codes for the representation of names of countries and their subdivisions – Part 1: Country codes
(DPS_IdentificationInformation.geographicDescription >
EX_GeographicDescription.geographicIdentifier > MD_Identifier.authority > CI_Citation.date >
CI_Date.date > Date.year) 1997
(DPS_IdentificationInformation.geographicDescription >
EX_GeographicDescription.geographicIdentifier > MD_Identifier.authority > CI_Citation.date >
CI_Date.date > Date.month) 00
(DPS_IdentificationInformation.geographicDescription >
EX_GeographicDescription.geographicIdentifier > MD_Identifier.authority > CI_Citation.date >
CI_Date.date > Date.day) 00
(DPS_IdentificationInformation.geographicDescription >
EX_GeographicDescription.geographicIdentifier > MD_Identifier.authority > CI_Citation.date >
CI_Date.dateType > CI_DateTypeCode) publication
(DPS_IdentificationInformation.geographicDescription >
EX_GeographicDescription.geographicIdentifier > MD_Identifier.code) CA – Canada
(DPS_IdentificationInformation.geographicDescription >
EX_GeographicDescription.extentTypeCode) 1 – inclusion

Identification scope

(DPS_IdentificationInformation.identificationScope > DPS_ScopeInformation.scopeIdentification) rootScope

F.4 Data content and structure

NRNC1/ISO19131ex is a feature-based product. An application schema expressed in UML (Section D.1) details the *NRNC1/ISO19131ex*'s content and an associated feature catalogue (Section D.2) provides the semantics of the *NRNC1/ISO19131ex* model elements.

Feature-based data

(DPS_FeatureBasedDataInformation.narrativeDescription) Basically, the *NRNC1/ISO19131ex* is presented as a UML package. The root feature type is *road network featur*e, which is characterized by a network identifier, a dataset name and a standards version identifier. *Road network feature* is subtyped by *network linear element, junction* and *point event*, which have different spatial and descriptive characteristics. *Network linear element* is a general description of linear road feature types that is subtyped by *road element* and *ferry connection*. *Event* is a feature type that describes special characteristics that occur on a *network linear element* without any geometric modifications of the *network segment* (such as segmentation). The two possible event types are *blocked passage* and *toll point*. *Junction* is a feature type that includes intersection between *network linear elements*.

Feature-based application schema

(DPS_FeatureBasedDataInformation.applicationSchema)

Not for Resale
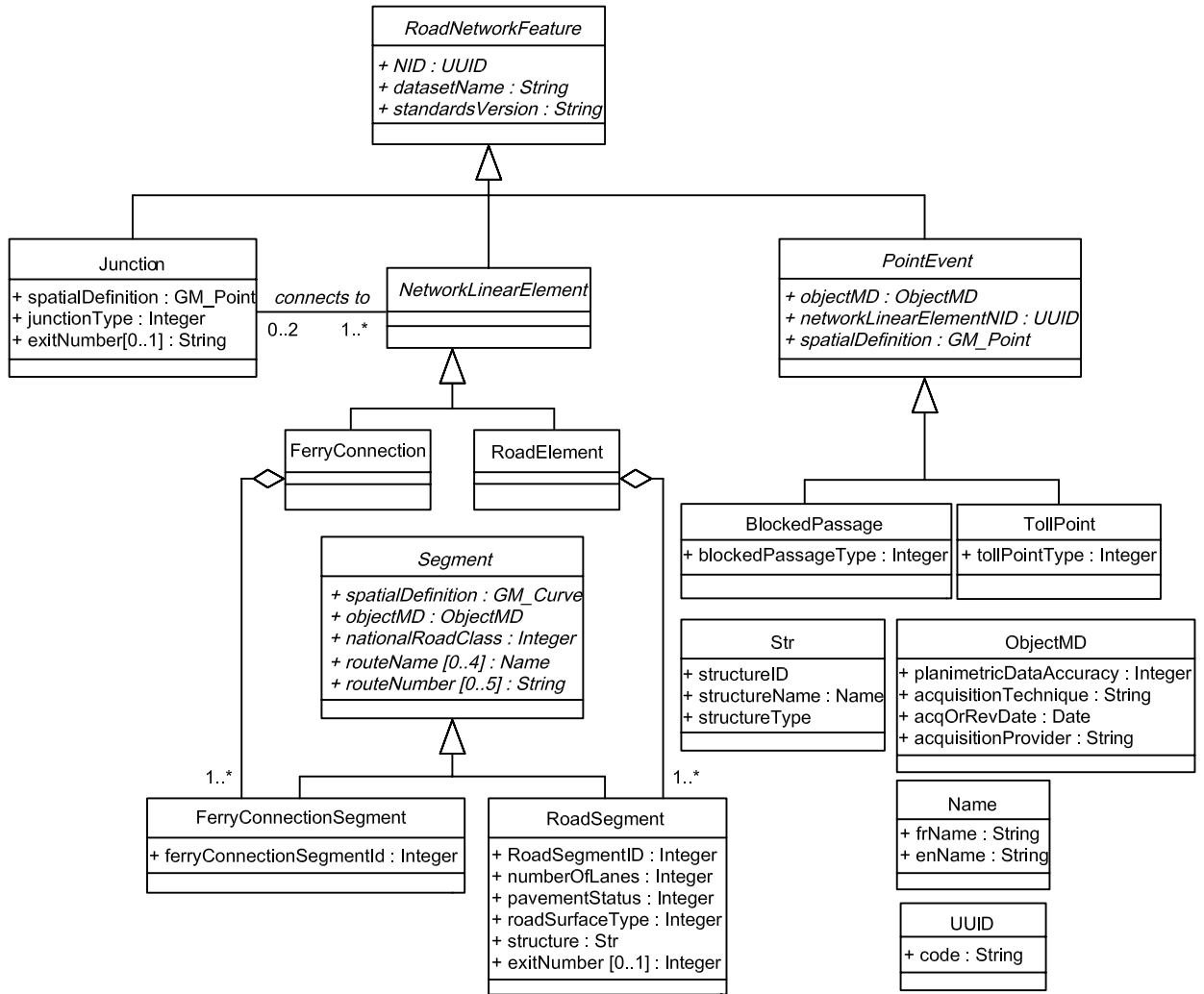
Figure F.1 — NRNC1/ISO19131ex UML Class Diagram

Feature-based feature Catalogue (sample)

This section provides the feature catalogue in support to the application schema. Spatial attributes are added to the feature catalogue in the same manner as other attributes for completeness and conformance to the application schema.

NOTE   As an example, this section provides only a sample of the complete feature catalogue of the *NRNC1/ISO19131ex*.

(DPS_FeatureBasedDataInformation.featureCatalogue)

Name:	**National Road Network, Canada, Level 1 – an ISO 19131 example (Conceptual segmented view)**
Scope:	Transportation
Field of application:	
Version Number:	1.0
Version Date:	May 2002
Definition Source:	
Definition Type:	
Producer:	Canadian Council on Geomatics – GeoBase Steering Committee
Functional Language:	

Feature Type

Name:	**Road Network Feature** (RoadNetworkFeature)
Definition:	The root feature type of the Road Network package.
Code:	
Aliases:	
Feature Operation Names:	
Feature Attribute Names:	National Road Network ID, Dataset Name, Standards version
Feature Association Names:	
Subtype Of:	

Feature Attribute

Name:	**National Road Network ID** (NID)
Definition:	The Universal Unique Identifier of the feature.
	NOTE In the case of Network Segment, all segments of the set of adjoining Network Segments between Network Junctions have the same NID.
Code:	
Value Data Type:	UUID
Value Measurement Unit:	
Value Domain Type:	0 ("not enumerated")
Value Domain:	

Feature Attribute

Name:	**Dataset Name** (datasetName)
Definition:	Province or territory occupied by the dataset.
Code:	
Value Data Type:	Integer
Value Measurement Unit:	
Value Domain Type:	1 ("enumerated")
Value Domain:	

Feature Attribute Value:

Label:	Code:	Definition:
Newfoundland and Labrador	1	
Nova Scotia	2	
Prince-Edward Island	3	
New-Brunswick	4	
Québec	5	
Ontario	6	
Manitoba	7	
Saskatchewan	8	
Alberta	9	
British Columbia	10	
Yukon Territories	11	
North West Territories	12	
Nunavut Territories	13	
Manitoba	7	

Feature Attribute
Name: **Standards Version** (standardsVersion)
Definition: Version number of the NRNC1/ISO19131ex Product Specifications to which the dataset conforms.
Code:
Value Data Type: String
Value Measurement Unit:
Value Domain Type: 0 ("not enumerated")
Value Domain:

Feature Type
Name: **Junction** (Junction)
Definition: A point feature that is always connected to one or more Road Segments or Ferry Connection Segments. A Junction is defined at the intersection of two or more road, at the intersection of a road and a ferry, at the end of a dead-end road and at the intersection of a road or ferry with a National, Provincial or Territorial Boundary.
NOTE   Grade-separated road crossings do not share a Junction. If a Junction is present at the location of the grade separation, it is either connected to the lower set of Road Segments or to the higher, but never to both.
Code:
Aliases:
Feature Operation Names:
Feature Attribute Names: Spatial Definition, Junction Type, Exit Number
Feature Association Names: Network Junction is connected to
Names:
Subtype Of: Road Network Feature

Feature Attribute
Name: **Spatial Definition** (spatialDefinition)
                            NOTE   Spatial Definition is included for completeness and conformance to the application schema.
Definition: Spatial representation of a Junction.
Code:
Value Data Type: GM_Point
Value Measurement Unit:
Value Domain Type: 0 ("not enumerated")
Value Domain:

Feature Attribute
Name: **Junction Type** (junctionType)
Definition: A type assignation based on the number of Road or Ferry Connection Segment Elements joining at a Junction.
Code:
Value Data Type: Integer
Value Measurement Unit:
Value Domain Type: 1 ("enumerated")
Value Domain:

Feature Attribute Value:		
Label:	Code:	Definition:
Intersection	1	An intersection between three or more Road Segments meeting at same grade level.
Dead End	2	A specific Junction that indicates that a Road Segment ends and is not connected to any other Road Segment or Ferry Connection Segment.
Ferry	3	A specific Junction that indicates that a Road Segment further continues as a Ferry Connection Segment.
NatProvTer	4	A specific Junction at the limit of a dataset indicating that a Road Segment or Ferry Connection Segment further continues in the following dataset.

Feature Attribute

Name: **Exit Number** (exitNumber)
Definition: The ID number of an exit on and off a controlled access thoroughfare, which has been assigned by an administrating body.
Code:
Value Data Type: String
Value Measurement Unit:
Value Domain Type: 0 ("not enumerated")
Value Domain:

Feature Association

Name: Junction connects to
Inverse Relationship: Network Linear Element connects to
Definition:
Code:
Feature Types Included: Network Linear Element
Order Indicator: 0 ("not ordered")
Cardinality: 1 : ?
Constraints:
Role Name:

Feature Type

Name: **Road Element** (RoadElement)
Definition: A road is a linear section of the Earth designed for, or the result of, vehicular movement. A Road Element is the representation of a road between Junctions. A Road Element is always bounded by two Junctions and composed of one or more Road Segment.
                                         NOTE   Where there are grade-separated road crossings, the bisecting Road Segments do not share a Junction. Grade-separated crossings between Road Segments involve road Structure objects, either Bridges or Tunnels. If a Junction is present at the location of the grade separation, it is either connected to the lower set of Road Segments or to the higher but never to both. Proposed roads are not represented within the NRNC1/ISO19131ex.
Code:
Aliases:
Feature Operation Names:
Feature Attribute Names:
Feature Association Names: Composed of Road Segments
Subtype Of: Network Linear Element

Feature-based content scope

(DPS_FeatureBasedDataInformation.contentScope > DPS_ScopeInformation.scopeIdentification) rootScope

F.5 Reference systems (DPS_ReferenceSystemInformation)

Spatial reference system
(DPS_ReferenceSystemInformation.spatialReferenceSystem >
MD_ReferenceSystem.referenceSystemIdentifier > RS_Identifier.code) Canadian Spatial Reference System – CSRS

Temporal reference system
(DPS_ReferenceSystemInformation.temporalReferenceSystem > TM_ReferenceSystem.name) Gregorian calendar

Reference system scope
(DPS_ReferenceSystemInformation.rsScope > DPS_ScopeInformation.scopeIdentification) rootScope

F.6 Data quality (DPS_DataQualityInformation)

Data quality
(DPS_DataQualityInformation.dataQuality > DQ_DataQuality.scope > DQ_Scope.level > MD_ScopeCode)
006 – series
(DPS_DataQualityInformation.dataQuality > DQ_DataQuality.scope > DQ_Scope.extent >
EX_Extent.description) Canada's landmass
(DPS_DataQualityInformation.dataQuality > DQ_DataQuality.report > DQ_Completeness)

NOTE   DQ_Completeness is not applicable

(DPS_DataQualityInformation.dataQuality > DQ_DataQuality.report >
DQ_TopologicalConsistency.nameOfMeasure) percentage of topological consistency
(DPS_DataQualityInformation.dataQuality > DQ_DataQuality.report > DQ_TopologicalConsistency.result >
DQ_QuantitativeResult.valueUnit > UnitOfMeasure.uomName) percentage
(DPS_DataQualityInformation.dataQuality > DQ_DataQuality.report >
DQ_AbsoluteExternalPositionalAccuracy.nameOfMeasure) standard circular error

NOTE   The accuracy of geometric representation is given by the difference between the position of the geometric
representation of an object and its absolute position, as measured with respect to the geodetic network. NRN linear
features shall be within a circular map accuracy standard (CMAS)[1] of 10 meters.

(DPS_DataQualityInformation.dataQuality > DQ_DataQuality.report >
DQ_AbsoluteExternalPositionalAccuracy.result > DQ_QuantitativeResult.valueUnit >
UnitOfMeasure.uomName) decametre
(DPS_DataQualityInformation.dataQuality > DQ_DataQuality.report > DQ_TemporalAccuracy)

NOTE   DQ_TemporalAccuracy is not applicable.

(DPS_DataQualityInformation.dataQuality > DQ_DataQuality.report > DQ_ThematicAccuracy)

NOTE   DQ_ThematicAccuracy is not applicable.

Quality scope
(DPS_DataQualityInformation.qualityScope > DPS_ScopeInformation.scopeIdentification) rootScope

F.7 Data capture (DPS_DataCaptureInformation)

(DPS_DataCaptureInformation.dataCaptureStatement)

Rules for linear feature geometry
In order to make the determination of the characteristics to the left and to the right of the road feature possible,
directionality of geometric representation of linear feature is standardized. Open curve and closed curve
conventions are used to depict the geometry of road features.

Open curve
Open curves are depicted according to the "Lower Left Rule" (see Figure F.2). According to this rule, the
direction of an open curve is determined from the coordinate sequence, that is to compare the first and the
last coordinate to determine the lowest coordinates and, if equal, the leftmost coordinate. Open curve vertices
are organized to comply with this convention.

---

1)   Standard circular error: $\sigma_c = 0{,}7071\ (\sigma_x^2 + \sigma_y^2)^{1/2}$
  σ_x: standard deviation in the X-axis
  σ_y: standard deviation in the Y-axis

  Circular map accuracy standard: CMAS = 2,1460 σ_c

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NOTE   Computations are carried out in latitude and longitude coordinates.

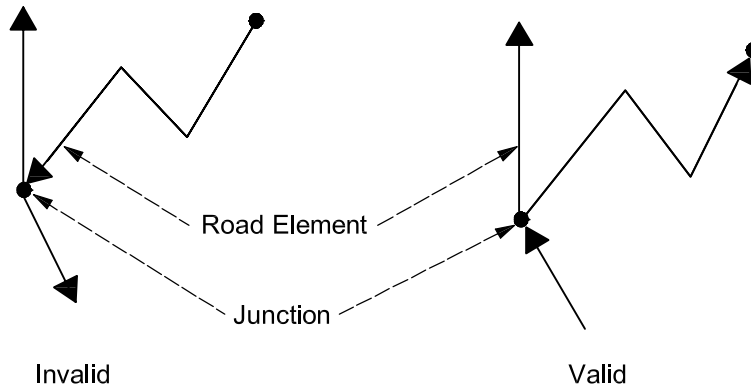Invalid   Valid

Figure F.2 — Lower left rule

Closed curve
Closed curves are depicted in a counterclockwise direction as shown in Figure F.3.

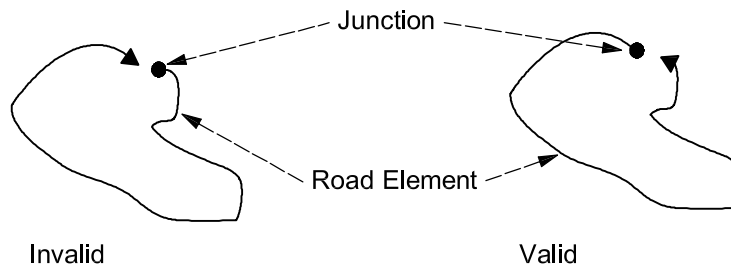Invalid   Valid

Figure F.3 — Counterclockwise rule

Segmentation rules
Linear network elements constitute the geometric structure of the *NRNC1/ISO19131ex*. These elements are segmented according to the following rules:

— where there is intersection at the same level with another linear element;

— where there is intersection with a provincial or territory boundary;

— where attribute values change.

Geometric representation
Geometric representation is the digital description of the spatial component of an object. With respect to ISO 19107, the *NRNC1/ISO19131ex* uses three types of geometric primitive: GM_Point, GM_Curve, and GM_Surface.

Data capture scope
(DPS_DataCaptureInformation.captureScope > DPS_ScopeInformation.scopeIdentification) rootScope

F.8 Data maintenance (DPSMaintenanceInformation)

Maintenance and update frequency
(DPS_MaintenanceInformation.maintenanceAndUpdateFrequency) The *NRNC1/ISO19131ex* data is updated as deemed necessary. Updates are inserted in the *NRNC1/ISO19131ex* data product when supplied by partners.

Maintenance scope
(DPS_MaintenanceInformation.maintenanceScope > DPS_ScopeInformation.scopeIdentification) rootScope

F.9 Data product delivery (DPS_DeliveryInformation)

Delivery medium information

Units of delivery
(DPS_DeliveryInformation.deliveryMedium > DPS_DeliveryMedium.unitsOfDelivery) Province

Medium name
(DPS_DeliveryInformation.deliveryMedium > DPS_DeliveryMedium.mediumName) Online via FTP

Delivery format information

GML
Format name
(DPS_DeliveryInformation.deliveryFormat > DPS_DeliveryFormat.formatName) Geography Markup Language – GML
Version
(DPS_DeliveryInformation.deliveryFormat > DPS_DeliveryFormat.version) v2.0
Specification
(DPS_DeliveryInformation.deliveryFormat > DPS_DeliveryFormat.specification) Geography Markup Language – GML – 2.0, OpenGIS® Implementation Specification, 20 February 2001, OGC Document Number 01-029
Language
(DPS_DeliveryInformation.deliveryFormat > DPS_DeliveryFormat.language) French, English
Character set
(DPS_DeliveryInformation.deliveryFormat > DPS_DeliveryFormat.characterSet > MD_CharacterSetCode) 004 – utf8

Shape

Format name
(DPS_DeliveryInformation.deliveryFormat > DPS_DeliveryFormat.formatName) Shape – ESRI™
Version
(DPS_DeliveryInformation.deliveryFormat > DPS_DeliveryFormat.version) Not applicable
Specification
(DPS_DeliveryInformation.deliveryFormat > DPS_DeliveryFormat.specification) ESRI Shapefile Technical Description, an ESRI White Paper, July 1998
Language
(DPS_DeliveryInformation.deliveryFormat > DPS_DeliveryFormat.language) French, English

Delivery scope
(DPS_DeliveryInformation.deliveryScope > DPS_ScopeInformation.scopeIdentification) rootScope

F.10 Metadata

Not applicable.

Bibliography

[1]   ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

[2]   ISO 19101:2002, *Geographic information — Reference model*

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