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Entwurf

**Geoinformation –
Produktspezifikationen für Geodaten (ISO/FDIS 19131:2022);
Englische Fassung prEN ISO 19131:2022**

Geographic information –
Data product specifications (ISO/FDIS 19131:2022);
English version prEN ISO 19131:2022

Information géographique –
Spécifications de contenu informationnel (ISO/FDIS 19131:2022);
Version anglaise prEN ISO 19131:2022

Anwendungswarnvermerk

Dieser Norm-Entwurf mit Erscheinungsdatum 2022-08-19 wird der Öffentlichkeit zur Prüfung und Stellungnahme vorgelegt.

Weil die beabsichtigte Norm von der vorliegenden Fassung abweichen kann, ist die Anwendung dieses Entwurfs besonders zu vereinbaren.

Stellungnahmen werden erbeten

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Nationales Vorwort

Dieses Dokument (prEN ISO 19131:2022) wurde vom Technischen Komitee ISO/TC 211 „Geographic information/Geomatics“ in Zusammenarbeit mit dem Technischen Komitee CEN/TC 287 „Geoinformation“ erarbeitet, dessen Sekretariat von BSI (Vereinigtes Königreich) gehalten wird, erarbeitet.

Das zuständige deutsche Normungsgremium ist der Arbeitsausschuss NA 005-03-03 AA „Geoinformation (SpA zu CEN/TC 287+ISO/TC 211)“ im DIN-Normenausschuss Bauwesen (NABau).

Dieses Dokument enthält unter Berücksichtigung des DIN-Präsidialbeschlusses 1/2004 nur die Englische Fassung von prEN ISO 19131:2022.

Für die in diesem Dokument zitierten Dokumente wird im Folgenden auf die entsprechenden deutschen Dokumente hingewiesen:

ISO 9000:2015	siehe	DIN EN ISO 9000:2015-11
ISO 19101-1:2014	siehe	DIN EN ISO 19101-1:2015-03
ISO 19108	siehe	DIN EN ISO 19108
ISO 19109:2015	siehe	DIN EN ISO 19109:2016-05
ISO 19110:2016	siehe	DIN EN ISO 19110:2017-05
ISO 19111	siehe	DIN EN ISO 19111
ISO 19112	siehe	DIN EN ISO 19112
ISO/TS 19115-1:2014	siehe	DIN EN ISO 19115-1:2014-07
ISO 19117	siehe	DIN EN ISO 19117
ISO 19157:2013	siehe	DIN EN ISO 19157:2014-04
ISO 19123:2005	siehe	DIN EN ISO 19123:2007-06
ISO 19126	siehe	DIN EN ISO 19126
ISO/TS 19139-1	siehe	DIN CEN ISO/TS 19139-1

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Änderungen

Gegenüber DIN EN ISO 19131:2012-01 wurden folgende Änderungen vorgenommen:

- a) Es wurde eine XML-Kodierung hinzugefügt;
- b) es wurden obligatorische Abschnitte eingeführt, die als Platzhalter dienen;
- c) das UML-Modell wurde umstrukturiert, wobei neue/umbenannte Attribute und Elemente eingeführt wurden, und ISO 19115-1 Datentypen wurden, wo möglich, verwendet;
- d) es wurden neue Attribute und Elemente eingeführt, um Informationen in der Übersicht zu trennen (6.2.7.2);

- e) in Abschnitt 6.2.7, „Class IdentificationSection“,
 - 1) wurde die Beschreibung und Identifizierung des Datenprodukts klar von der Beschreibung und Identifizierung der Spezifikation getrennt;
 - 2) wurde der Datentyp für das Attribut *purpose* geändert, um die Erläuterung des Zwecks des Datenprodukts anhand von Anwendungsfällen zu ermöglichen;
 - 3) wurde das Attribut *extent* geändert, um zusätzlich zur geografischen Ausdehnung auch die zeitliche und vertikale Ausdehnung angeben zu können; und
 - 4) wurde ein neues Attribut *restriction* eingeführt, das zur Beschreibung von Einschränkungen bei der Handhabung des Datenprodukts dient;
- f) im Anwendungsbereich:
 - 1) wurden Beziehungen zwischen Bereichen entfernt (das Konzept der super- und sub-scopes), und
 - 2) wurde eine Anforderung eingeführt, dass mindestens eines der Attribute *level*, *levelName* oder *extent* für jeden Bereich verwendet werden muss;
- g) der Abschnitt Dateninhalt und -struktur (6.5) wurde unter Verwendung von Elementen aus ISO 19115-1 umstrukturiert;
- h) im Abschnitt „Bezugssysteme“ (6.6) wurde der Datentyp des Attributs *temporalReferenceSystem* geändert;
- i) im Abschnitt „Datenqualität“ (6.7):
 - 1) wurde die Anforderung, Datenqualitätselemente aufzulisten, für die keine Qualitätsanforderungen definiert sind entfernt, und
 - 2) es wurde ein neues Attribut *requirementId* eingeführt, um in anderen Zusammenhängen auf eine bestimmte Datenqualitätsanforderung verweisen zu können.
- j) im Abschnitt „Datenerfassung und -produktion“ (6.8) wurden neue Elemente und Attribute eingeführt, um Informationen abzubilden, die zuvor im Attribut *dataCaptureStatement* enthalten waren;
- k) im Abschnitt „Wartung“ (6.9) wurden die Angaben zur Wartung obligatorisch gemacht, der Datentyp des Attributs *maintenanceAndUpdateFrequency* wurde geändert, und es wurde ein neues obligatorisches Attribut eingeführt;
- l) im Abschnitt „Zustellung“ (6.11) wurde ein neues Attribut *deliveryService* eingeführt;
- m) der Abschnitt „Metadaten“ (6.12) wurde umstrukturiert und es wurden neue Attribute eingeführt, um den zu verwendenden Metadatenstandard und die Kodierung zu spezifizieren, sowie eine Möglichkeit zu beschreiben, wie bestimmte Metadatenelemente verwendet werden sollen;
- n) es wurde ein empfohlenes Layout eingeführt;
- o) eine detaillierte Übersicht über die Änderungen und die Rückwärtskompatibilität findet sich in Anhang B.

Nationaler Anhang NA (informativ)

Begriffe

Die Benennungen der folgenden Begriffe sind identisch mit den Benennungen in der englischen Fassung.

3 Begriffe

Für die Anwendung dieses Dokuments gelten die folgenden Begriffe.

ISO und IEC stellen terminologische Datenbanken für die Verwendung in der Normung unter den folgenden Adressen bereit:

— ISO Online Browsing Platform: verfügbar unter <https://www.iso.org/obp>

— IEC Electropedia: verfügbar unter <http://www.electropedia.org/>

3.1

Anwendung

en **application**

Be- und Verarbeitung von Daten zur Unterstützung von Nutzeranforderungen

[QUELLE: ISO 19101-1:2014, 4.1.1]

3.2

Anwendungsschema

en **application schema**

Konzeptuelles Schema (3.4) für Daten, das für eine oder mehrere *Anwendungen* (3.1) erforderlich ist

[QUELLE: ISO 19101-1:2014, 4.1.2]

3.3

konzeptuelles Modell

en **conceptual model**

Modell, das einen abstrahierten Ausschnitt der realen Welt abbildet (3.23)

[QUELLE: ISO 19101-1:2014, 4.1.5]

3.4

konzeptuelles Schema

en **conceptual schema**

formale Beschreibung eines *konzeptuellen Modells* (3.3)

[QUELLE: ISO 19101-1:2014, 4.1.6]

3.5

Qualitätskonformitätsschwellwert

en **conformance quality level**

Schwellwert oder Reihe von Schwellwerten zur Ermittlung der *Qualität* von Daten (3.20), mit denen bestimmt wird, wie gut ein *Datensatz* (3.10) die in dessen *Datenprodukt-Spezifikation* (3.9) oder den Benutzeranforderungen festgelegten Kriterien erfüllt

Anmerkung 1 zum Begriff: Im Zusammenhang mit ISO 19131 bezieht sich Datensatz auf Datenprodukt.

[QUELLE: ISO 19157:2013, 4.4]

3.6

Coverage

en **coverage**

Feature (3.13), das als Funktion zur Rückgabe von Werten aus seinem Wertebereich für jede direkte Position innerhalb seines räumlichen, zeitlichen oder räumlich-zeitlichen Bereichs dient

BEISPIEL Rasterbild, Flächenverschneidung oder digitale Höhenmatrix

[QUELLE: ISO 19123:2005, 4.1.7, modifiziert – Anmerkung zum Begriff wurde gelöscht.]

3.7

Datenerfassung

en **data capture**

Aktion oder Prozess der Datenerhebung

Anmerkung 1 zum Begriff: Die Erfassung kann durch menschliche Interaktion (z. B. durch Beobachtung vor Ort) oder durch Computer erfolgen.

3.8

Datenprodukt

en **data product**

Datensatz (3.10) oder *Serie von Datensätzen* (3.11), der/die bereitgestellt werden kann

Anmerkung 1 zum Begriff: ein Datenprodukt kann zusätzliche Informationen wie *Darstellung* (3.19), *Datenqualität* (3.20), *Metadaten* (3.17) und Ausgabeformat enthalten.

3.9

Datenprodukt-Spezifikation

en **data product specification**

Spezifikation (3.21) eines *Datenprodukts* (3.8) verbunden mit ergänzenden Informationen, die deren Erstellung, Lieferung an und Nutzung durch Dritte ermöglicht

Anmerkung 1 zum Begriff: Eine Produktspezifikation für Daten stellt eine Beschreibung des *Gegenstandsbereichs* (3.23) sowie eine Spezifikation für die Abbildung des Diskursuniversums auf einen Datensatz bereit. Sie darf zu Produktions-, Verkaufs-, Endnutzer-, und sonstigen Zwecken verwendet werden.

3.10

Datensatz

en **dataset**

identifizierbare Sammlung von Daten

Anmerkung 1 zum Begriff: Ein Datensatz kann eine kleinere Gruppierung von Daten sein, die sich physikalisch innerhalb eines größeren Datensatzes befindet, auch wenn der Datensatz durch einige Einschränkungen, wie z. B. die räumliche Ausdehnung oder eine *Feature-Klasse* (3.13), begrenzt ist. Theoretisch kann ein Datensatz so klein wie ein einzelnes *Feature* oder ein *Feature-Attribut* (3.15) sein, das in einem größeren Datensatz enthalten ist. Auch eine gedruckte Karte kann als ein Datensatz angesehen werden.

[QUELLE: ISO 19115-1:2014, 4.3]

3.11

Serie von Datensätzen

en **dataset series**

Sammlung von *Datensätzen* (3.10) mit gemeinsamen Produktspezifikationen

[QUELLE: ISO 19115-1:2014, 4.4]

3.12

Bereich

en **domain**

wohldefinierter Bereich

Anmerkung 1 zum Begriff: „Wohldefiniert“ bedeutet, dass die Definition sowohl notwendig als auch ausreichend ist, da alles, was die Definition erfüllt, im Bereich enthalten ist, und alles, was die Definition nicht erfüllt, notwendigerweise außerhalb des Bereichs liegt.

[QUELLE: ISO 19109:2015, 4.8]

3.13

Feature

en **feature**

Abstraktion eines Phänomens der realen Welt

Anmerkung 1 zum Begriff: Ein Feature kann als ein Typ oder eine Instanz vorkommen. Feature-Typ oder Feature-Instanz ist zu verwenden, wenn nur eines gemeint ist.

[QUELLE: ISO 19101-1:2014, 4.1.11]

3.14

Feature-Assoziation

en **feature association**

Beziehung, die Instanzen einer *Feature*-Klasse (3.13) mit Instanzen derselben oder einer anderen *Feature*-Klasse verbindet

Anmerkung 1 zum Begriff: Eine *Feature*-Assoziation (3.13) kann als Typ oder Instanz vorkommen. Feature-Assoziationstyp oder Feature-Assoziationsinstanz ist zu verwenden, wenn eine einzelne Feature-Assoziation gemeint ist.

Anmerkung 2 zum Begriff: Feature-Assoziationen umfassen auch die Aggregation von Features.

[QUELLE: ISO 19110:2016, 3.3]

3.15

Feature-Attribut

en **feature attribute**

Merkmal eines *Features* (3.13)

Anmerkung 1 zum Begriff: Ein *Feature*-Attribut (3.13) kann als Typ oder *Bereich* (3.12) vorkommen. Feature-Attributtyp oder Feature-Attributinstanz ist zu verwenden, wenn ein einzelnes Feature-Attribut gemeint ist.

Anmerkung 2 zum Begriff: Ein *Feature*-Attribut (3.13) hat einen Name, einen Datentyp und einen Bereich. Ein Feature-Attribut für eine Feature-Instanz besitzt einen Attributwert, der aus dem Bereich stammt.

[QUELLE: ISO 19101-1:2014, 4.1.12, modifiziert — BEISPIEL 1 und 2 wurden gelöscht, Anmerkung 2 und 3 wurden gelöscht und eine neue Anmerkung 2 wurde hinzugefügt.]

3.16

geographische Daten

en **geographic data**

Daten mit einem impliziten oder expliziten Ortsbezug zur Erde

Anmerkung 1 zum Begriff: „Geoinformation“ wird auch als Begriff für Informationen zu Phänomen mit einem impliziten oder expliziten Ortsbezug zur Erde verwendet

[QUELLE: ISO 19109:2015, 4.13]

3.17

Metadaten

en **metadata**

Daten zur Berechnung von Ressourcen

[QUELLE: ISO 19115-1:2014, 4.10]

3.18

Modell

en **model**

Abstraktion einiger Aspekte der Realität

3.19

Darstellung

en **portrayal**

Präsentation von Geoinformationen in einer für Menschen verständlichen Form

3.20

Qualität

en **quality**

Gesamtheit der Merkmale eines Produkts, die sich auf dessen Fähigkeit auswirken, ausdrücklich angegebene und stillschweigend vorhandene Bedürfnisse zu erfüllen

[QUELLE: ISO 9000:2015, 3.6.2, modifiziert – Anmerkung 1 und 2 wurden gelöscht.]

3.21

Spezifikation

en **specification**

Dokument, das Anforderungen festlegt

[QUELLE: ISO 9000:2015, 3.8.7, modifiziert – Anmerkung 1 und 2 wurden gelöscht.]

3.22

Spezifikationsumfang

en **specification scope**

Definition eines Teils eines *Datenprodukts* (3.8) mit bestimmten Merkmalen

Anmerkung 1 zum Begriff: Der Umfang einer Spezifikation kann beispielsweise auf einer räumlichen oder zeitlichen Ausdehnung, bestimmten *Feature*typen (3.13) oder -eigenschaften oder einer Produkthierarchie basieren.

3.23

Gegenstandsbereich

en **universe of discourse**

Ausschnitt der realen oder hypothetischen Welt, der für eine Anwendung wesentlich ist

[QUELLE: ISO 19101-1:2014, 4.1.38]

Nationaler Anhang NB (informativ)

Literaturhinweise

DIN EN ISO 9000:2015-11, *Qualitätsmanagementsysteme — Grundlagen und Begriffe (ISO 9000:2015); Deutsche und Englische Fassung EN ISO 9000:2015*

DIN EN ISO 19101-1:2015-03, *Geoinformation — Referenzmodell — Teil 1: Grundsätze (ISO 19101-1:2014); Englische Fassung EN ISO 19101-1:2014*

DIN EN ISO 19108, *Geoinformation — Zeitliches Schema*

DIN EN ISO 19109:2016-05, *Geoinformation — Regeln zur Erstellung von Anwendungsschemata (ISO 19109:2015); Englische Fassung EN ISO 19109:2015*

DIN EN ISO 19110:2017-05, *Geoinformation — Objektartenkataloge (ISO 19110:2016); Englische Fassung EN ISO 19110:2016*

DIN EN ISO 19111, *Geoinformation — Koordinatenreferenzsysteme*

DIN EN ISO 19112, *Geoinformation — Raumbezug mit (geographischen) Identifikatoren*

DIN EN ISO 19115-1:2014-07, *Geoinformation — Metadaten — Teil 1: Grundsätze (ISO 19115-1:2014); Englische Fassung EN ISO 19115-1:2014*

DIN EN ISO 19117, *Geoinformation — Darstellung*

DIN EN ISO 19157:2014-04, *Geoinformation — Datenqualität (ISO 19157:2013); Englische Fassung EN ISO 19157:2013*

DIN EN ISO 19123:2007-06, *Geoinformation — Coverage Geometrie- und Funktionsschema (ISO 19123:2005); Englische Fassung EN ISO 19123:2007*

DIN EN ISO 19126, *Geoinformation — Verzeichnisse und Register für Featurekonzepte*

DIN CEN ISO/TS 19139-1, *Geoinformation — XML-Schema-Implementierung — Teil 1: Kodierungsregeln*

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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.

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 ISO documents 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).

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. 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).

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.

This document was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 287, *Geographic Information*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 19131:2007), which has been technically revised. It also incorporates ISO 19131:2007/Amd 1:2011.

The main changes are as follows:

- XML encoding has been added;
- mandatory sections working as place holders have been introduced;
- the UML model has been restructured, introducing new/renamed attributes and elements, and ISO 19115-1 datatypes have been used where possible;
- new attributes and elements have been introduced to separate information in the overview (6.2.7.2).
- in subclause 6.2.7, "Class IdentificationSection,":
 - the description and identification of the data product has been clearly separated from the description and identification of the specification,
 - the data type for attribute *purpose* has been changed to allow explanation of the purpose of the data product using use cases,
 - the attribute *extent* has been changed to allow specification of temporal and vertical extent, in addition to the geographical extent; and

- a new attribute *restriction* has been introduced, used to describe handling restrictions of the data product;
- in the Scope:
 - relations between scopes have been removed (the concept of super- and sub-scopes), and
 - a requirement has been introduced that at least one of the attributes *level*, *levelName*, or *extent* shall be used for each scope;
- the Data content and structure section (6.5) has been restructured using elements from ISO 19115-1;
- in the Reference systems section (6.6), the data type of the attribute *temporalReferenceSystem* has been changed;
- in the Data quality section (6.7):
 - the requirement to list data quality elements that have no defined quality requirements has been removed, and
 - a new attribute *requirementId* has been introduced, to be able to reference a specific data quality requirement in other contexts;
- in the Data capture and production section (6.8), new elements and attributes have been introduced, to contain information previously located in the attribute *dataCaptureStatement*;
- in the Maintenance section (6.9), information about maintenance has been made mandatory, and the data type of the attribute *maintenanceAndUpdateFrequency* has been changed, with a new mandatory attribute introduced;
- in the Delivery section (6.11), a new attribute *deliveryService* has been introduced;
- the Metadata section (6.12) has been restructured and new attributes introduced to specify the metadata standard and encoding to be used, as well as a possibility to describe how specific metadata elements should be used;
- a recommended layout has been introduced;
- a detailed overview regarding changes and backwards compatibility can be found in Annex B.

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.

Introduction

A data product specification is a specification of a dataset or dataset series together with additional information that will enable it to be created, supplied to and used by another party. In this context of creating, supplying and using data products, the specification thereof is of essence in a controlled and standardized process leading to interoperability. The data product specification is the final product in a process that describes the conceptual formalization of semantics and data structure related to specific requirements or use cases. It is a precise and full description of the data product in terms of the requirements that it will or may fulfil. A data product specification is primarily a technical document that may contain non-technical elements such as narrative descriptions of some aspects, like the overview or data capture statements. However, for various reasons compromises can need to be made in the implementation.

The purpose of this document is to provide requirements on the content of data product specifications, in conformance with other existing International Standards for geographic information. This conformance is at different levels. Firstly, there is the aspect of a dataset and its metadata conforming to a data product specification, and secondly that the data product specification conforms to this document. Some of the items used to specify the data product in a data product specification can also be used as metadata for a data product that conforms to the data product specification. Figure 1 shows how a data product specification relates to datasets and their metadata.

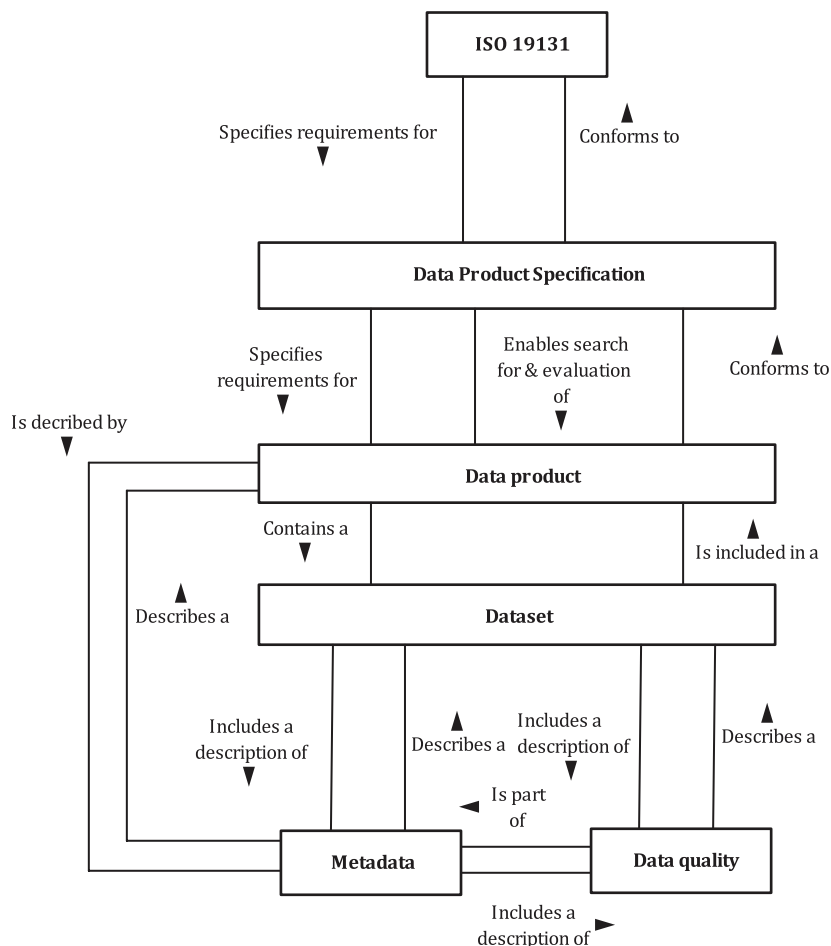


Figure 1 — Relations between this document (ISO 19131), the data product specification and the datasets

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.

This document describes the content, structure and encoding of a data product specification.

This document contains URIs for normative statements, conformance classes, conformance tests and requirements classes. Other International Standards are also referenced with URIs. URIs to normative statements within this document are a combination of the namespace <https://standards.iso.org/19131/-/2> and the local identifier. The description of elements in the local identifiers can be found at <https://committee.iso.org/sites/tc211/home/resolutions/isotc-211-good-practices/--structure-of-uris-in-isotc-211.html>.

The name and contact information of the maintenance agency for this document can be found at www.iso.org/maintenance_agencies.

Geographic information — Data product specifications

1 Scope

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

This document specifies XML encoding of data product specifications.

This document provides OWL representation of the underlying UML model. See Annex F.

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

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 639-2, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

ISO 19103, *Geographic information — Conceptual schema language*

ISO 19108, *Geographic information — Temporal schema*

ISO 19115-1, *Geographic information — Metadata — Part 1: Fundamentals*

ISO 19157, *Geographic information — Data quality*

3 Terms and definitions

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

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

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

3.1 application

manipulation and processing of data in support of user requirements

[SOURCE: ISO 19101-1:2014, 4.1.1]

3.2 application schema

conceptual schema (3.4) for data required by one or more *applications* (3.1)

[SOURCE: ISO 19101-1:2014, 4.1.2]

3.3 conceptual model

model that defines concepts of a *universe of discourse* (3.23)

[SOURCE: ISO 19101-1:2014, 4.1.5]

3.4 conceptual schema

formal description of a *conceptual model* (3.3)

[SOURCE: ISO 19101-1:2014, 4.1.6]

3.5 conformance quality level

threshold value or set of threshold values for data *quality* (3.20) results used to determine how well a *dataset* (3.10) meets the criteria set forth in its *data product specification* (3.9) or user requirements

Note 1 to entry: In the context of ISO 19131, dataset refers to data product.

[SOURCE: ISO 19157:2013, 4.4]

3.6 coverage

feature (3.13) that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal domain

EXAMPLE Raster image, polygon overlay, digital elevation matrix.

[SOURCE: ISO 19123:2005, 4.1.7, modified — NOTE has been deleted.]

3.7 data capture

action or process of collecting data

Note 1 to entry: The capture can be by human interaction (such as field observation) or by computers.

3.8 data product

dataset (3.10) or *dataset series* (3.11) that may be supplied

Note 1 to entry: A data product may contain additional information such as *portrayal* (3.19), data *quality* (3.20), *metadata* (3.17) and distribution format.

3.9 data product specification

specification (3.21) of a *data product* (3.8) together with additional information that will enable it to be created, supplied to and used by another party

Note 1 to entry: A data product specification provides a description of the *universe of discourse* (3.23) and a specification for mapping the universe of discourse to a data product. It may be used for production, sales, end-use or other purposes.

3.10 dataset

identifiable collection of data

Note 1 to entry: A dataset may be a smaller grouping of data which, though limited by some constraint such as spatial extent or *feature* (3.13) type, is located physically within a larger dataset. Theoretically, a dataset may be as small as a single feature or *feature attribute* (3.15) contained within a larger dataset. A hardcopy map or chart may be considered a dataset.

[SOURCE: ISO 19115-1:2014, 4.3]

3.11

dataset series

collection of *datasets* (3.10) sharing common characteristics

[SOURCE: ISO 19115-1:2014, 4.4]

3.12

domain

well-defined set

Note 1 to entry: "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.

[SOURCE: ISO 19109:2015, 4.8]

3.13

feature

abstraction of real-world phenomena

Note 1 to entry: A feature may occur as a type or an instance. Feature type or feature instance shall be used when only one is meant.

[SOURCE: ISO 19101-1:2014, 4.1.11]

3.14

feature association

relationship that links instances of one *feature* (3.13) type with instances of the same or a different feature type

Note 1 to entry: A *feature* (3.13) 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 to entry: Feature associations include aggregation of features.

[SOURCE: ISO 19110:2016, 3.3]

3.15

feature attribute

characteristic of a *feature* (3.13)

Note 1 to entry: A *feature* (3.13) attribute has a name, a data type and a value *domain* (3.12) associated to it. A feature attribute for a feature instance has an attribute value taken from the value domain.

Note 2 to entry: A *feature* (3.13) attribute may occur as a type or an instance. Feature attribute type or feature attribute instance is used when only one is meant.

[SOURCE: ISO 19101-1:2014, 4.1.12, modified — EXAMPLES 1 and 2 were deleted, Notes 2 and 3 to entry were deleted and a new Note 2 to entry has been added.]

3.16

geographic data

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

Note 1 to entry: Geographic information is also used as a term for information concerning phenomena implicitly or explicitly associated with a location relative to the Earth.

[SOURCE: ISO 19109:2015, 4.13]

3.17

metadata

information about a resource

[SOURCE: ISO 19115-1:2014, 4.10]

3.18

model

abstraction of some aspects of reality

3.19

portrayal

representation of information for human interpretation

3.20

quality

degree to which a set of inherent characteristics of an object fulfils requirements

[SOURCE: ISO 9000:2015, 3.6.2, modified — Notes 1 and 2 to entry have been deleted.]

3.21

specification

document stating requirements

[SOURCE: ISO 9000:2015, 3.8.7, modified — Notes 1 and 2 to entry have been deleted.]

3.22

specification scope

definition of a part of a *data product* (3.8) with certain characteristics

Note 1 to entry: A specification scope may be based on spatial or temporal extent, certain *feature* (3.13) types or properties or product hierarchy, for example.

3.23

universe of discourse

view of the real or hypothetical world that includes everything of interest

[SOURCE: ISO 19101-1:2014, 4.1.38]

4 Symbols and abbreviated terms

4.1 Abbreviated terms

This document adopts the following conventions for presentation purposes:

UML	Unified Modeling Language
XML	Extensible Markup Language
URI	Uniform Resource Identifier
OWL	Web Ontology Language

4.2 Unified Modeling Language

In this document, conceptual schemas are presented in the Unified Modeling Language (UML). ISO 19103 presents the specific profile of UML used in this document.

4.3 Externally defined classes

Several model elements used in this document are defined in packages specified in other International Standards; these are listed in Table 1.

Table 1 — Externally defined classes

Class name	Package	International standard
CI_Citation	Citation	ISO 19115-1
CI_Date	Citation	ISO 19115-1
CI_Responsibility	Citation	ISO 19115-1
DQ_ConformanceResult	Data Quality	ISO 19157
DQ_DescriptiveResult	Data Quality	ISO 19157
DQ_Element	Data Quality	ISO 19157
DQ_QuantitativeResult	Data Quality	ISO 19157
EX_Extent	Extent	ISO 19115-1
LanguageCode	Language-characteraset localization	ISO 19115-1
LI_ProcessStep	Lineage	ISO 19115-1
LI_Source	Lineage	ISO 19115-1
MD_ApplicationSchemaInformation	Metadata	ISO 19115-1
MD_CharacterSetCode	Metadata	ISO 19115-1
MD_ClassificationCode	Metadata	ISO 19115-1
MD_Constraints	Metadata	ISO 19115-1
MD_ContentInformation	Metadata	ISO 19115-1
MD_CoverageDescription	Metadata	ISO 19115-1
MD_FeatureCatalogue	Metadata	ISO 19115-1
MD_FeatureCatalogueDescription	Metadata	ISO 19115-1
MD_Keywords	Metadata	ISO 19115-1
MD_MaintenanceFrequencyCode	Metadata	ISO 19115-1
MD_ReferenceSystem	Metadata	ISO 19115-1
MD_Resolution	Metadata	ISO 19115-1
MD_ScopeCode	Metadata	ISO 19115-1
MD_SpatialRepresentationTypeCode	Metadata	ISO 19115-1
MD_TopicCategoryCode	Metadata	ISO 19115-1
MediaType		ISO 19103
TM_PeriodDuration	Temporal	ISO 19108

5 Conformance

5.1 General

In this document two conformance classes are defined (see 5.2 and 5.3). The related tests are provided in the abstract test suite in Annex A.

Requirements and recommendations are explicitly marked and assigned a requirement identifier or a recommendation identifier.

5.2 Content of a data product specification

Table 2 describes the conformance class for the content of a data product specification.

Table 2 — Content conformance class

Conformance class	.../conf/content
Standardization target type	Instance of a data product specification, regardless of data encoding

Table 2 (continued)

Conformance class	.../conf/content
Dependency	https://standards.iso211.org/19103/-/1/ (Conceptual schema language): <ul style="list-style-type: none"> — Conformance class UML2 — Conformance class CoreExtendedTypes Classes referred to in this document, as specified in: https://standards.iso211.org/19108/-/1/ (Temporal schema) https://standards.iso211.org/19115/-/1/1/ (Metadata – Part 1: Fundamentals) https://standards.iso211.org/19157/-/1/ (Data quality)
Requirements class	.../req/content (see Clause 6)
Tests	All tests in Clause A.1

Requirement URIs in Clause 6 are based on .../req/content/ and are distinguished by the requirement identifier.

Recommendation URIs in Clause 6 are based on .../rec/optionalContent/ and distinguished by the recommendation identifier.

5.3 XML encoding of a data product specification

Table 3 describes the conformance class for the XML representation of a data product specification.

Table 3 — XML encoding conformance class

Conformance class	.../conf/xml
Standardization target type	XML document representing a data product specification
Dependency	.../conf/content
Requirements class	.../req/xml (see Clause 7)
Tests	All tests in A.2

Requirement URIs in Clause 7 are based on .../req/xml/ and are distinguished by the requirement identifier.

6 Requirements for data product specifications

6.1 General

Subclauses 6.2 to 6.13 describe elements of a data product specification based on the conceptual UML model for ISO 19131 (second edition) being part of the ISO/TC 211 harmonized model. Furthermore, additional descriptions, requirements and recommendations are included. A compact documentation of the elements in the UML model is provided in Annex C.

Annex D contains an example of a data product specification's content according to the content in 6.2 to 6.13.

Subclause 6.14 provides a recommendation on how to order the elements described in 6.2 to 6.13 when human readability is prioritized.

The rules that apply for the content of a data product specification comprise a requirements class summarized in Table 4.

Table 4 — Requirements class for the content of a data product specification

Requirements class	.../req/content
Standardization target type	Instance of a data product specification, regardless of data encoding
Dependency	https://standards.isotc211.org/19103/-/1/ (Conceptual schema language)
Dependency	https://standards.isotc211.org/19108/-/1/ (Temporal schema)
Dependency	https://standards.isotc211.org/19115/-1/1/ (Metadata – Part 1: Fundamentals)
Dependency	https://standards.isotc211.org/19157/-/1/ (Data quality)
Requirement	.../req/content/specificationModel
Requirement	.../req/content/specificationLanguage
Requirement	.../req/content/identificationModel
Requirement	.../req/content/extent
Requirement	.../req/content/scopeModel
Requirement	.../req/content/scopeCover
Requirement	.../req/content/specificationScope
Requirement	.../req/content/scopelIdentification
Requirement	.../req/content/contentModel
Requirement	.../req/content/contentScope
Requirement	.../req/content/referenceModel
Requirement	.../req/content/referenceScope
Requirement	.../req/content/qualityLevel
Requirement	.../req/content/qualityModel
Requirement	.../req/content/qualityScope
Requirement	.../req/content/captureModel
Requirement	.../req/content/captureScope
Requirement	.../req/content/maintenanceModel
Requirement	.../req/content/maintenanceScope
Requirement	.../req/content/maintenanceUpdateFrequency
Requirement	.../req/content/portrayalModel
Requirement	.../req/content/portrayalScope
Requirement	.../req/content/deliveryModel
Requirement	.../req/content/deliveryScope
Requirement	.../req/content/deliverySpecification
Requirement	.../req/content/metadataModel
Requirement	.../req/content/metadataScope
Requirement	.../req/content/additionalModel
Requirement	.../req/content/additionalContent

In addition to the requirements class in Table 4, a recommendations class is defined in Table 5. These recommendations, when implemented, can contribute to improved content of a data product specification. However, recommendations are optional and do not have an impact on the results of conformance testing, thus the recommendations class in Table 5 is not related to any of the conformance classes defined in Clause 4.

Table 5 — Recommendations class for the content of a data product specification

Recommendations class	.../rec/optionalContent
Standardization target type	Instance of a data product specification, regardless of data encoding
Dependency	.../req/content
Recommendation	.../rec/optionalContent/useCase
Recommendation	.../rec/optionalContent/contentFeatures
Recommendation	.../rec/optionalContent/contentCoverage
Recommendation	.../rec/optionalContent/contentApplication
Recommendation	.../rec/optionalContent/contentComplete
Recommendation	.../rec/optionalContent/metadataMinimum
Recommendation	.../rec/optionalContent/dpsLayout

6.2 Structure and content of a data product specification

6.2.1 Data product specifications and data products

A data product specification defines the requirements for a data product. It forms the basis for producing, acquiring and exploiting a data product. It may also help potential users to evaluate the data product to determine its fitness for use.

6.2.2 Sections

A data product specification is divided into sections. Each section covers and specifies a specific aspect of the data product. All sections are always included in the data product specification, even when there is no content. This provides a stable and recognizable structure across different data product specifications.

Each section may be further divided based on specification scopes (see 6.4), to specify different requirements for different parts of the data product.

This document specifies the following sections:

- identification section, as specified in 6.3:
 - title, abstract,
 - use case descriptions;
- scope section, as specified in 6.4:
 - different ranges within the data product;
- data content and structure section, as specified in 6.5:
 - feature concept dictionary (ISO 19126),
 - feature catalogue (ISO 19110),
 - application schema (ISO 19109);
- reference systems section, as specified in 6.6:
 - coordinate reference systems (ISO 19111),
 - system using geographic identifiers (ISO 19112),

- temporal reference systems (ISO 19108);
- data quality section, as specified in 6.7:
 - data quality measure and threshold values for acceptance (ISO 19157);
- data capture and production section, as specified in 6.8:
 - processing catalogue;
- maintenance section, as specified in 6.9:
 - maintenance statement;
- portrayal section, as specified in 6.10:
 - portrayal catalogue (ISO 19117),
 - map legend;
- delivery section, as specified in 6.11:
 - data media,
 - download services,
 - view services;
- metadata section, as specified in 6.12:
 - metadata standard,
 - metadata profile;
- additional information section, issues not covered by other clauses, as specified in 6.13.

6.2.3 Specification scopes

When, within a section, specific requirements and descriptions are applicable for different parts of a data product, the section contains one object for each specific part. Each such object is associated with one specification scope that describes the specific part.

This is valid for all sections except for the data product identification section, which always addresses the complete data product. All specification scopes shall be defined in the scope section.

Specification scopes are specified in 6.4.

6.2.4 Specification overview and description

The specification overview and description are intended to give information about the data product specification itself. It may be seen as metadata of the data product specification, in addition to terms and abbreviations used in the data product specification.

The overview (6.2.7.2) may include general information about what a data product specification is together with reading instructions, but also information specific to the data product specification itself, such as its conformance to ISO 19131, change history, initiative, collaboration, etc.

The intention of the overview, in contrast to the abstract (6.3.2.4), is not to give information about the data product.

6.2.5 Dependency on other standards

Figure 2 illustrates the dependency of this document on other International Standards.

This document presents a conceptual schema for data product specifications. The conceptual schema is specified using the Unified Modeling Language (UML) profile as described in ISO 19103.

Classes defined in this document refer to, and use as data types, classes defined in other standards. Each class in this document as well as those from other standards, belongs to one UML package. The dependencies between UML packages are described in Figure 2.

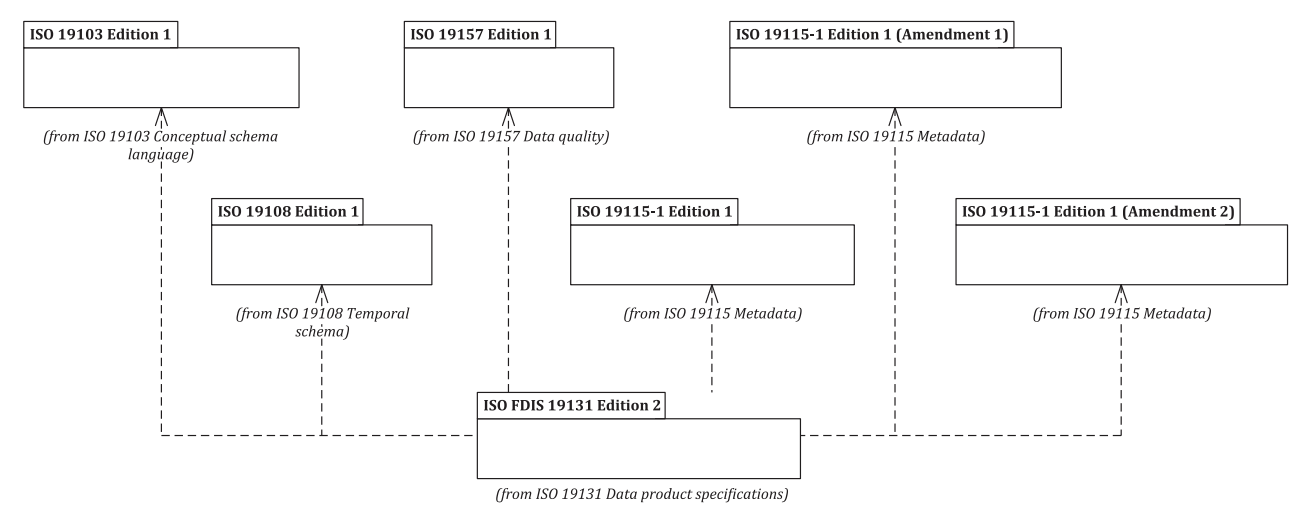


Figure 2 — UML package structure with dependencies

6.2.6 Requirements

Requirement: .../req/content/specificationModel
A data product specification shall include sections and data in conformance to UML model in Figure 3.

Requirement: .../req/content/specificationLanguage
A unique <i>DataProductSpecification</i> instance shall be used for each language a data product specification is written in.

The UML model in Figure 3 describes class *DataProductSpecification* including all associations to section specific classes. Figure 4 describes dependencies to elements defined in other International Standards.

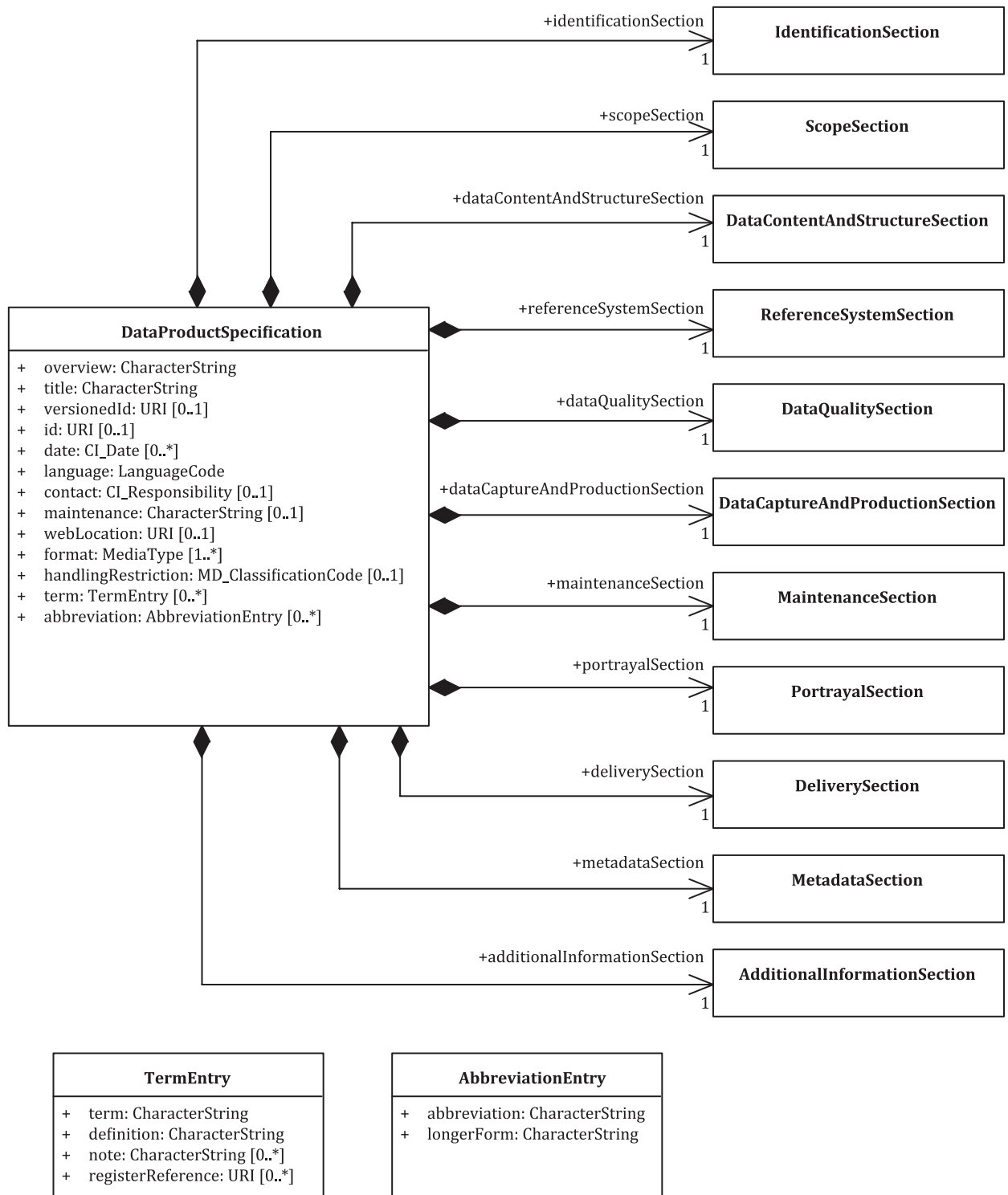


Figure 3 — Class DataProductSpecification and relations to section specific classes

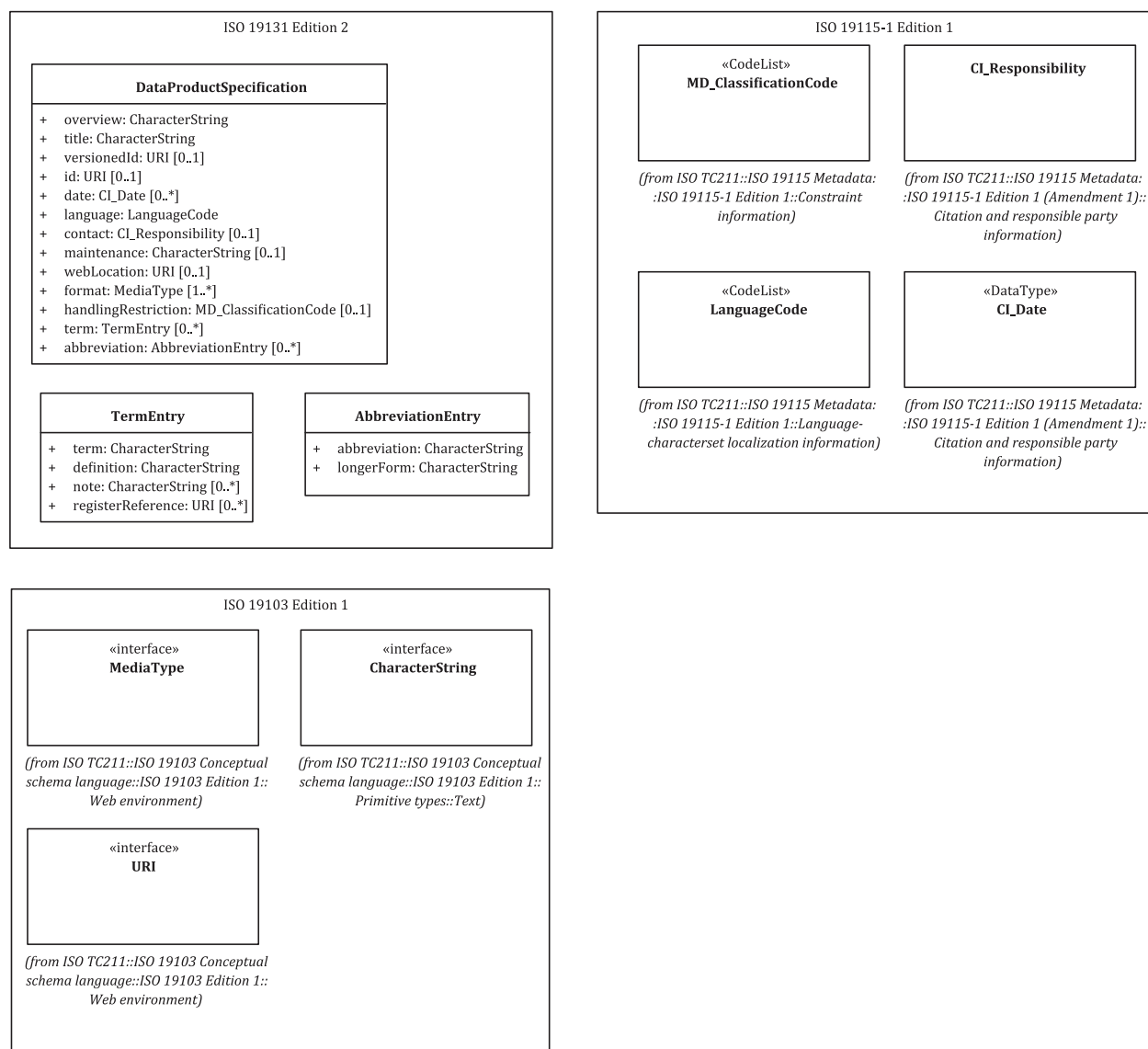


Figure 4 — Data Product Specification — Dependencies to elements defined in other standards including fully qualified namespaces

6.2.7 Class DataProductSpecification

6.2.7.1 Semantics

An object of the *DataProductSpecification* class represents a single instance of a data product specification. Each instance of a data product specification contains a constant set of section objects. Each section object may contain one or more content objects (see 6.3 to 6.13 for section details). Where the specification uses the scope feature, to specify different parts of the product, each section content object relates to exactly one scope.

NOTE All sections in a data product specification are mandatory. The intention with mandatory sections is to provide a recognizable structure. However, some of the parts might not contain any information, which is expressed by 0..* multiplicity from the section classes to the related content classes. This is described in the related paragraphs for the Additional information section (6.13), Data capture and production section (6.8) and Portrayal section (6.10), where there is no content required.

6.2.7.2 Attribute overview

The attribute *overview* contains a short, human-readable, narrative description of the data product specification, see 6.2.4.

overview: CharacterString [1]

6.2.7.3 Attribute title

The attribute *title* contains the official designation of the data product specification.

title: CharacterString [1]

6.2.7.4 Attribute versionedId

The optional attribute *versionedId* contains a persistent uniform resource identifier for identifying this version of the data product specification.

versionedId: URI [0..1]

6.2.7.5 Attribute id

The optional attribute *id* contains a persistent uniform resource identifier for identifying the latest version of the data product specification.

id: URI [0..1]

6.2.7.6 Attribute date

Each occurrence of the optional attribute *date* contains a date for a significant event in the life cycle of the data product specification.

NOTE Such events include when the data product specification was created, changed, approved and published.

date: CI_Date [0..*]

6.2.7.7 Attribute language

The attribute *language* contains a language code according to ISO 639-2 for the language that is used in the data product specification.

language: LanguageCode [1]

6.2.7.8 Attribute contact

The optional attribute *contact* contains contact information for the party that is responsible for the data product specification.

contact: CI_Responsibility [0..1]

6.2.7.9 Attribute webLocation

The optional attribute *webLocation* contains an URL for a web site location where the data product specification can be downloaded.

webLocation: URI [0..1]

6.2.7.10 Attribute maintenance

The optional attribute *maintenance* contains a narrative description of the maintenance regime for the data product specification.

`maintenance: CharacterString [0..1]`

6.2.7.11 Attribute format

Each occurrence of the attribute *format* contains the file format in which the data product specification is provided at a web site location.

NOTE Examples of formats are “application/pdf” and “text/xml”.

`format: MediaType [1..*]`

6.2.7.12 Attribute handlingRestriction

The optional attribute *handlingRestriction* contains a classification code specifying limitations on handling the data product specification.

`handlingRestriction: MD_ClassificationCode [0..1]`

6.2.7.13 Attribute term

Each occurrence of the optional attribute *term* contains a word or expression that is applicable to the data product specification.

`term: TermEntry [0..*]`

6.2.7.14 Attribute abbreviation

Each occurrence of the optional attribute *abbreviation* contains a shortened form of a written word or phrase that is applicable to the data product specification.

`abbreviation: AbbreviationEntry [0..*]`

6.2.7.15 Role identificationSection

The role *identificationSection* represents the identification section which identifies the data product, see 6.3.

`identificationSection: IdentificationSection [1]`

6.2.7.16 Role scopeSection

The role *scopeSection* represents the scope section, see 6.4.

`scopeSection: ScopeSection [1]`

6.2.7.17 Role dataContentAndStructureSection

The role *dataContentAndStructureSection* represents the data content and structure section, see 6.5.

`dataContentAndStructureSection: DataContentAndStructureSection [1]`

6.2.7.18 Role referenceSystemSection

The role *referenceSystemSection* represents the reference systems section, see 6.6.

`referenceSystemSection: ReferenceSystemSection [1]`

6.2.7.19 Role `dataQualitySection`

The role *dataQualitySection* represents the data quality section, see 6.7.

`dataQualitySection: DataQualitySection [1]`

6.2.7.20 Role `dataCaptureAndProductionSection`

The role *dataCaptureAndProductionSection* represents the data capture and production section, see 6.8.

`dataCaptureAndProductionSection: DataCaptureAndProductionSection [1]`

6.2.7.21 Role `maintenanceSection`

The role *maintenanceSection* represents the maintenance section, see 6.9.

`maintenanceSection: MaintenanceSection [1]`

6.2.7.22 Role `portrayalSection`

The role *portrayalSection* represents the data portrayal section, see 6.10.

`portrayalSection: PortrayalSection [1]`

6.2.7.23 Role `deliverySection`

The role *deliverySection* represents the data delivery section, see 6.11.

`deliverySection: DeliverySection [1]`

6.2.7.24 Role `metadataSection`

The role *metadataSection* represents the metadata section, see 6.12.

`metadataSection: MetadataSection [1]`

6.2.7.25 Role `additionalInformationSection`

The role *additionalInformationSection* represents the additional information section, see 6.13.

`additionalInformationSection: AdditionalInformationSection [1]`

6.2.8 Class `TermEntry`

6.2.8.1 Semantics

The class *TermEntry* is a datatype for definition of a term.

6.2.8.2 Attribute `term`

The attribute *term* contains the term to be used for a concept.

`term: CharacterString [1]`

6.2.8.3 Attribute definition

The attribute *definition* contains a representation of a concept by a descriptive statement which serves to differentiate it from related concepts.

```
definition: CharacterString [1]
```

6.2.8.4 Attribute note

Each occurrence of the optional attribute *note* contains a note of the concept.

```
note: CharacterString [0..*]
```

6.2.8.5 Attribute registerReference

Each occurrence of the optional attribute *registerReference* contains a reference to an entry in a register defining the concept.

```
registerReference: URI [0..*]
```

6.2.9 Class AbbreviationEntry

6.2.9.1 Semantics

The class *AbbreviationEntry* holds an abbreviation and its full text version.

6.2.9.2 Attribute abbreviation

The attribute *abbreviation* contains a shortened form of a written word or phrase used in place of the whole word or phrase.

```
abbreviation: CharacterString [1]
```

6.2.9.3 Attribute longerForm

The attribute *longerForm* contains the full text version of an abbreviation.

```
longerForm: CharacterString [1]
```

6.3 Identification section

6.3.1 Requirements

The purpose of the identification section is to provide information for identification, search, discovery and first evaluation of data products.

Requirement: .../req/content/identificationModel

The identification section shall conform to the UML model described in Figure 5. A single object of the class <i>IdentificationSection</i> shall specify information for the entire data product by specifying a specification scope that comprises the entire data product.
--

Recommendation: .../rec/optionalContent/useCase
--

To increase potential users' understanding of what purposes the data product serves, the data product specification should provide use case(s).
