DGIWG profile of
ISO 19131 Geographic information – Data product specification

DRAFT STANDARD

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Introduction

A data product specification is a precise technical description which characterizes a geospatial data product. It includes general information for data identification as well as information for data content and structure, reference system, data quality aspects, data capture, maintenance, delivery and metadata.

A data product specification may be created and used on different occasions, by different parties and for different reasons. However, the main reason for creating a data product specification is to define the characteristics of a newly developed data product.

As datasets or dataset series have to fulfill military requirements this has to be reflected in the data product specification. Therefore the purpose of this DGIWG-profile of the International Standard 19131 is to give guidance for creating data product specifications in consideration of military requirements.

1 Scope

This descriptive DGIWG-profile of the International Standard for data product specifications "ISO 19131 Geographic information – Data product specification" describes data product specifications for military requirements for geographic data products. This profile is based on the ISO/DIS 19131:2005 and has to be revised when ISO/DIS 19131:2005 changes status to ISO 19131. The aim of this profile is to provide a clear and similar structure for any data product specification to be written. This profile shall be in conformance with all the other standards that are being developed within DGIWG.

2 Relationship to base standard ISO 19131 / Conformance

According to ISO 19106:2004, this DGIWG-profile is of level 2 conformance to ISO 19131. Therefore mandatory requirements of the base standard remain mandatory. Differences to the base standard (options, extensions) will be made explicit by a note in the appropriate clause.
Any product specification that claims conformance with this descriptive profile shall be in conformance with ISO 19131 and with the special rules given in this profile.
Annex A provides a set of abstract tests.

NOTE   A profile is derived from base standards so that by definition, conformance to a profile is conformance to the base standards from which it is derived.

3 Normative references

ISO 19101-2:—[1] Geographic information - Reference model - Part 2: Imagery

ISO 19104:2004 Geographic information - Terminology

ISO 19106:2004 Geographic information – Profiles

ISO 19108:2002 Geographic information – Temporal schema

ISO 19109:2005 Geographic information – Rules for application schema

ISO 19110:2005 Geographic information – Methodology for feature cataloguing

ISO 19111:2003 Geographic information – Spatial referencing by coordinates

ISO 19112:2003 Geographic information – Spatial referencing by geographic identifiers

ISO 19113:2002 Geographic information – Quality principles

ISO 19115:2003 Geographic information – Metadata

ISO 19117:—[1] Geographic information – Portrayal

ISO 19123:2005 Geographic information – Schema for coverage geometry and functions

ISO 19129—[1] Geographic information – Imagery, gridded and coverage data framework

ISO 19131—[1] Geographic information – Data product specification

ISO/DTS 19138:2004 Geographic information – Data quality measures

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[1] To be published.

4 Terms and definitions

NOTE   Generally the terms and definitions of the base standards ISO 19106:2004 and ISO/DIS 19131:2005 apply to this profile as well. For a better understanding of this document, the main terms and definitions are repeated.

4.1   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 [adopted from ISO/DIS 19131:2005]

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 purpose.

4.2   extraction guide

instruction describing the capturing process

4.3   profile

set of one or more base standards or subsets of base standards, and, where applicable, the identification of chosen clauses, classes, options and parameters of those base standards, that are necessary for accomplishing a particular function [adopted from ISO 19106:2004]

NOTE   A profile is derived from base standards so that by definition, conformance to a profile is conformance to the base standards from which it is derived.

4.4   coverage-based data

coverage-based content and structure of data information

EXAMPLE   Raster image, digital elevation matrix

4.5   feature-based data

feature-based content and structure of data information

5 Abbreviations

DGIWG   Digital Geospatial Information Working Group
DIGEST   Digital Geographic Information Exchange Standard
DIS   Draft International Standard
DTS   Draft Technical Specification
ISO   International Organisation for Standardization
UML   Unified Modelling Language
VMap   Vector Map

6 General structure and content of a data product specification

A data product specification defines the requirements for a data product. It shall contain sections covering the following aspects of the data product [adopted from ISO/DIS 19131:2005]:

-   Overview – see Clause 7
-   Terms and definitions – see Clause 8
-   Specification scopes – see Clause 9
-   Data product identification – see Clause 10
-   Data content and structure– see Clause 0
-   Reference systems – see Clause 12
-   Data quality – see Clause 13
-   Data product delivery – see Clause 17
-   Metadata – see Clause 19

A data product specification may also contain sections covering the following aspects of the data product [adopted from ISO/DIS 19131:2005]:

- Data capture – see Clause 14 (this section is optional, but strongly recommended)
- Data maintenance – see Clause 15
- Portrayal – see Clause 16
- Additional information – see Clause 18

Each of these sections of the data product specification is described in the following clauses.

NOTE   Apart from section *Terms and definitions* sections are adopted from ISO/DIS 19131:2005. In addition the order of the sections is changed.

7   Overview

The overview section provides a reader of a data product specification with general introductory information about the data product along with product specification metadata.
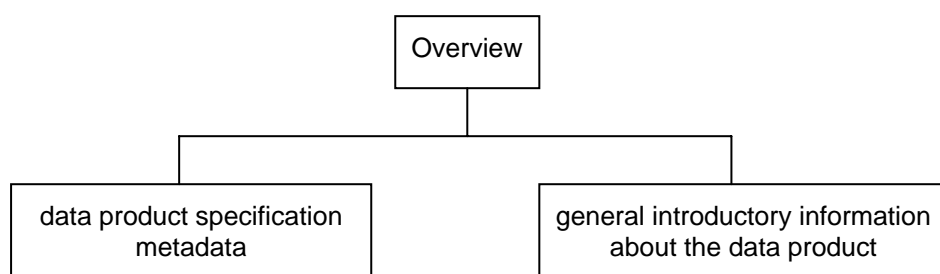
The data product specification metadata shall provide information to uniquely identify the data product specification as well as information about the creation of the data product specification. The data product specification metadata shall include the following items [extension to ISO/DIS 19131:2005]:

Table 1: Data product specification metadata

Item name	Description	card	Type
title	title of the data product specification	1	CharacterString
edition	version of the data product specification	1	CharacterString
date	date the product specification was created / last updated	1	Date
language	language(s) of the data product specification, e.g. translations	1..*	CharacterString (ISO 639-2)
classification	classification code of the handling restriction on the data product specification	1	MD_ClassificationCode (ISO 19115)
contact	party responsible for the data product specification	1	CI_ResponsibleParty (ISO 19115)
URL	online-address where the resource is downloadable	0..1	URL

The general introductory information is an informal description of the data product for which the data product specification is written. It shall include [adopted from ISO/DIS 19131:2005]:

- the name of the data product
- informal description of the data product

To allow a better understanding of the specification furthermore the informal description shall include the following aspects [change of obligation to ISO/DIS 19131:2005]:

- the content of the dataset
- spatial extent of the data

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

The informal description may also include the following aspects [adopted from ISO/DIS 19131:2005]

- temporal extent of the data
- data sources and data production processes
- maintenance of the data

The informal description may also include the following aspects [extension to ISO/DIS 19131:2005]

- any acronyms of the data product

Table 2: General introductory information about the data product

Item name	Description	card	Type
name	Official designation of the data product	1	CharacterString
abstract	informal description of the data product	1	CharacterString
acronym	any acronyms of the data product	0..*	CharacerString
content	Textual description of the content of any dataset compliant with the considering specification	1	CharacterString
spatial extent	Description of the spatial extent covered by the data product	1	EX_Extent (ISO 19115)
temporal extent	Description of the temporal extent covered by the data product	0..1	EX_Extent (ISO 19115)
specificPurpose	specific purpose for which the data shall be or has been collected	1	CharacterString
dataSource	Identification of the kinds of data source usable to product datasets compliant with the considering specification	0..*	CharacterString
productionProcess	Textual description of the production process applicable to the datasets compliant with the considering specification	0..*	CharacterString
maintenance	Textual description of the maintenance process applicable to the datasets compliant with the considering specification	0..1	CharacterString

8 Terms, definitions and abbreviations

For a better understanding of the data product specification, special terms used in the data product specification shall be defined in this section.

If a term is already defined either in the ISO/TC 211 terms and definition database or in the terms and definition document of the DGIWG Knowledgebase, this definition shall be referenced. If a term is not defined, its definition shall be written according to the rules specified by ISO 19104:2004.

NOTE   Section "Terms and definitions" is an extension to the base standard ISO/DIS 19131:2005.

Table 3: Terms and definitions

Item name	Description	card	Type
term	One word, or a short group of word	1	CharacterString
definition	Definition of the term	1	CharacterString
termNote	Potentially notes may be added to complete the definition, specify a domain etc.	0..*	CharacterString

Table 4: Abbreviations

Item name	Description	card	Type
abbreviation	abbreviation used within the specification	1	CharacterString
definition	long version of the term	1	CharacterString
acronym	any acronym for the term	0..1	CharacterString

9 Specification scopes

A specification scope defines a part of the data product to which a section of the data product specification applies. If a specification is homogeneous across the whole data product it is only necessary to define a general scope (root scope), which applies to each section of this data product specification.

If a data product specification specifies a:
- multilevel product (like in VMap),
- multitheme product (each theme has one content specification),
- location dependent product (content specification varies over the product extent e.g. due to different available data source for different areas)
-

The information in the different sections of the specification only applies to parts of the data product. In this case each part shall be clearly identified by a scope.

Independent of the homogeneity of the product specification the information describing each specification scope shall include [adopted from ISO/DIS 19131:2005]:

- scope identification

For a homogeneous specification the scope shall include items from the following as required to describe the scope. For an inhomogeneous specification the information of the scope dependent on the type of the inhomogeneous product and may include:

- for a multilevel product:
  - level
  - level name
  - level description

- for a multitheme product:
  - coverage

- for location dependent:
  - extent

EXAMPLE: An example for a common data product specification for a multilevel data product and distinctions based on hierarchical levels is given by the VMap data product specification. VMap consists of different granularities named level 0, level 1, level 2 and UVMap (large scale maps for urban areas). They correspond to different levels of detail and are based on the same feature coding catalogue.

Table 5: Specification scope information

Item name	Description	card	Type
scope identification	specific identification of the scope	1	CharacterString
level	hierarchical level of the data specified by the scope (levels, e.g. dataset, are defined in class	0..1	MD_ScopeCode (ISO19115)
level name	name of the hierarchy level (e.g. Vmap Level 0)	0..1	Character String
level description	detailed description about the level of the data specified by the scope	0..1	Character String
coverage	Coverages to which the information applies	0..1	Character String
extent	spatial, vertical and temporal extent of the data	0..1	EX_Extent (ISO 19115)

10 Data product identification

The information identifying the data product shall include the following items [adopted from ISO/DIS 19131:2005]:

- title
- abstract
- topic category
- geographic description

This section shall also include the items [change of obligation to ISO/DIS 19131:2005]:

- spatial resolution
- purpose

and [extension to ISO/DIS 19131:2005]:

- language
- classification

The following optional items may be included when appropriate [adopted from ISO/DIS 19131:2005]:

- alternate title
- spatial representation type

Additional to the optional items this section may include [extension to ISO/DIS 19131:2005]:

- point of contact
- use limitation

Table 6: Identification information

Item name	Description	card	Type
title	the title of the data product	1	Character String
alternate title	short name or other name by which the data product is known	0..1	Character String
abstract	brief narrative summary of the content of the data product	1	Character String
topic category	the main theme(s) of the data product	1..*	MD_TopicCategory Code (ISO 19115)
geographicDescription	description of the geographic area covered by the data product using identifiers	1	EX_GeographicDescription (ISO 19115)
spatialResolution	factor which provides a general understanding of the density of spatial data in the data product	1	MD_Resolution (ISO 19115)

Item name	Description	card	Type
purpose	summary of the intention with which the data product is developed	1	Character String
language	language(s) of the dataset If language is not applicable, e.g. for raster data, use "not applicable" as value for the element	1..*	Character String (ISO 639-2)
classification	classification code of the handling restriction on the data product	1	MD_ClassificationCode (ISO 19115)
spatialRepresentationType	form of the spatial representation	0..1	MD_SpatialRepresentationTypeCode (ISO 19115)
pointOfContact	identification of, and means of communication with, person(s) and organization(s) associated with the data	0..*	CI_ResponsibleParty (ISO 19115)
useLimitation	limitation affecting the fitness for use of the data product	0..1	Character String

11 Data content and structure

ISO 19131 gives different requirements for data product specifications whether the data is feature- or coverage-based or imagery data.

11.1 Feature-based data

The content information of a feature-based data product is described in terms of an application schema and a feature catalogue [adopted from ISO/DIS 19131:2005].

The data product specification shall refer to the application schema of the data product. For all data product specifications in the realm of DGIWG, the application schema shall be expressed in UML. All other rules of ISO 19131 concerning the creation of the application schema and especially conformance to ISO 19109:2005 apply as well.

The data product specification shall include a full description of each feature type including attributes, attribute values and relationships in the data product. Additionally it shall externally reference a feature and attribute catalogue. The feature and attribute catalogue shall be realized in accordance with ISO 19110:2005.

11.2 Coverage-based and imagery data

The content information of a coverage-based data product (including imagery data product) shall be described in accordance with ISO 19101-2, ISO 19129, and ISO 19123:2005. The content information shall be described in the following manner [adopted from ISO/DIS 19131:2005]:

Table 7: Coverage-based and imagery data

Item name	Description	card	Type
coverage ID	unique identifier of coverage,	1	Character String
Coverage description	technical description of the coverage,	1	Character String
coverage type	type of the coverage,	1	Character String
specification	additional information	1	CV_Coverage (ISO 19123)

12 Reference systems

The data product specification shall include information that defines the reference systems used in the data product. This shall include the following [change of cardinality to ISO/DIS 19131:2005]:

- spatial reference system

This may include [change of obligation to ISO/DIS 19131:2005]:

- temporal reference system

The spatial reference system used may be either a coordinate system in conformance with ISO 19111:2003 or a spatial reference system using geographic identifiers in conformance with ISO 19112:2003. The temporal reference system shall be in conformance to ISO 19108:2002.

Table 8: Reference system identification

Item name	Description	card	Type
spatialReferenceSystem	reference system identifier(s) of spatial reference system used, e.g. different UTM zones can be considered as different reference systems	1..*	MD_ReferenceSystem (ISO 19115)
temporalReferenceSystem	reference system identifier of temporal reference system used	0..1	TM_ReferenceSystem (ISO 19108)

13 Data quality

The data product specification shall identify the data quality requirements for the data product in accordance with ISO 19113:2002.

As data quality requirements can be defined for different parts of a data product the information shall include [adopted from ISO/DIS 19131:2005]:

- scope

For every data quality scope it is necessary to list all the data quality elements and data quality sub-elements defined in ISO 19113:2002, even if only to state that a specific data quality element or data quality sub-element is not applicable for this data quality scope [adopted from ISO/DIS 19131:2005].

For an applicable data quality element or data quality sub-element the following items shall be identified [extension to ISO/DIS 19131:2005]:

- name of measure

For an applicable data quality element or data quality sub-element the following items shall be identified [adopted from ISO/DIS 19131:2005]:

- value unit
- value

Table 9: Quality information

Item name	Description	card	Type
scope	the specific data to which the data quality information applies	1..*	DQ_Scope (ISO 19115)
nameOfMeasure	name of a quantitative descriptor of the quality of a data product as it is given in Annex C of ISO 19138:2004 or from an official register of data quality measures	1	NameOfMeasure (ISO 19138:)
valueUnit	unit of a data quality value,	1	UnitOfMeasure (ISO 19115)
value	data quality value required for the data product (acceptable conformance quality level) corresponding to the data quality measure	1	Record (ISO 19115)

14 Data capture

The data product specification shall provide general information on how the data is to be captured [change of obligation to ISO/DIS 19131:2005]. The data capture statement shall include [adopted from ISO/DIS 19131:2005]:

- a general description of the sources and
- a general description of the processes and rules

to be used. Any organization performing data capture for the data product defined by the data product specification shall provide a reference to the detailed extraction guide used for the capturing process.

NOTE   An extraction guide is an important part of a data product specification that has to be written before a capturing process can start.

Table 10: Data capture information

Item name	Description	card	Type
data source	Identification of the kinds of data sources usable to product datasets compliant with the considering specification	0..*	Character String
production process	Textual description of the production process applicable to the datasets compliant with the considering specification	0..1	Character String

15 Data maintenance

The data product specification shall provide the principles and criteria applied in the maintenance of the data [change of obligation to ISO/DIS 19131:2005]. This shall include [adopted from ISO/DIS 19131:2005]:

- maintenance and update frequency

and [extension to ISO/DIS 19131:2005]:

- update scope

The data maintenance section shall include [extension to ISO/DIS 19131:2005]:

- a general description of the sources and
- a general description of the processes and rules

Maintenance information shall also provide procedures how known errors in the data shall be handled. Any organisation performing data maintenance for the data product defined by the data product specification shall provide a reference to the detailed maintenance guide used for the maintenance process.

Table 11: Maintenance information

Item name	Description	card	Type
maintenanceAndUpdateFrequency	frequency with which changes and additions are made to the data product	1	MD_MaintencanceInformation (ISO 19115)
updateScope	parts of a data product to which maintenance will be applied	1	MD_ScopeCode (ISO 19115)

Item name	Description	card	Type
data source	Identification of the kinds of data sources usable to product datasets compliant with the considering specification	0..*	Character String
production process	Textual description of the production process applicable to the datasets compliant with the considering specification	0..1	Character String

16 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 [adopted from ISO/DIS 19131:2005].

If a portrayal catalogue is given it shall be defined in accordance with ISO 19117 (or the appropriate DGIWG profile).

Table 12: Portrayal information

Item name	Description	card	Type
portrayalCatalogueCitation	bibliographic reference to the portrayal catalogue	0..1	CI_Citation (ISO 19115)

17 Data product delivery

The data product specification shall define the format in which the data product is delivered and delivery medium information.

If a data product can be delivered in different formats then the appropriate information for each shall be given. Delivery format information shall include the following items [change of obligation to ISO/DIS 19131:2005]:

- format name
- version
- language
- character set

Delivery format information may also include [adopted from ISO/DIS 19131:2005]:

- specification
- file structure

Delivery medium information may include [adopted from ISO/DIS 19131:2005]:

- units of delivery

Table 13: Delivery information

Item name	Description	card	Type
formatName	name of the data format	1	Character String
version	version of the format (date, number, etc.)	1	Character String
language	language(s) in which the dataset is delivered If language is not applicable, e.g. for raster data, use "not applicable" as value for the element	1..*	Character String (ISO 639-2)

characterSet	full name of the character coding standard used for the dataset (western european requirement, greek, turkish, cyrillic)	1	MD_CharacterSet Code (ISO 19115)
specification	name of a subset, profile, or product specification of the format	0..1	Character String
fileStructure	structure of delivery file	0..1	Character String
unitsOfDelivery	description of the units of delivery (e.g. tiles, geographic areas)	0..1	Character String

18 Additional information

This section of the data product specification may include any other aspects of the data product not provided elsewhere in this specification. If this information only applies to a part of the data product, then the scope for this must be clearly identified [adopted from ISO/DIS 19131:2005].

Table 14: Additional information

Item name	Description	card	Type
additionalInformation	any additional information to describe the data product	0..1	Character String

19 Metadata

The data product specification shall define the metadata elements to describe the content, reference system, quality, and other characteristics of the data. The metadata elements shall be in conformance with ISO 19115 and include the core metadata elements of this standard [adopted from ISO/DIS 19131:2005].

The information of this section can be structured in two different ways:

1. The section can include a reference to an existing metadata profile which is based on ISO 19115
2. The section can include a profile as an annex which is based on ISO 19115 – Annex C and Annex I.

The format and encoding of the metadata shall be stated in the data product specification [adopted from ISO/DIS 19131:2005].

Annex A

(normative)

Abstract test suites

A data product specification claiming conformance with this profile of ISO 19131 shall pass the abstract tests A.1, A.2 and A.3 of the abstract test suites of ISO 19131.

For the extensions stated in this DGIWG profile of ISO/DIS 19131:2005 the abstract tests A.1, A.2 and A.3 of the abstract test suites of ISO 19131 apply as well.

Annex B

(normative)

Discovery of product specifications using Dublin Core (Register Content Model)

DIS/ISO 19131:2005 defines the core content of a product specification. This profile of DIS/ISO 19131:2005 extends it to cover the military requirements. The existence of consistent product specifications is a very important goal, but it's common that the available product specifications remain unknown or untraceable. In order to address this issue, one option is the establishment of registers providing the necessary information to ensure a proper discovery of the existing product specifications.

In order to ensure the consistency of such product specification registers and to enable an interoperable access to those registers, it is important to define the product specification related set of metadata elements that may be involved in the discovery process. The intent here is to populate these discovery metadata elements with the product specification defined in this profile of ISO 19115.

Due to the nature of the registered resources (product specification) and the purpose of the register (discovery), the Dublin Core metadata standard seems more appropriate. This annex
- Defines a consistent set of Dublin Core metadata elements to be managed in a product specification register;
- Maps these Dublin Core metadata elements to the product specification defined in this profile of DIS/ISO 19131:2005.

It is highly recommended to publish the content of the product specifications registers using the "Catalogue Service for the Web (CS-W)" of the Open Geospatial Consortium. Consequently, the Dublin Core metadata elements described hereafter are compatible with the OGC core, i.e. the profile of Dublin Core defined in CS-W.

The items involved in the registration of product specification for discovery comes from the overview section. The table below provides for each item of the overview section:
- The item name;
- The item description
- The Dublin core path of the item candidate for registration;
- The OGC Name of the Dublin core element. Only the queryable Dublin Core elements have a name defined in the CS-W publication. The unnamed Dublin Core elements are only returnable.

Some of the overview items are represented using the same Dublin core metadata element.

Table 15: Mapping of the Dublin Core metadata elements to the DGIWG profile of ISO 19131 Geographic information - Data product specification

Item name	Item description	Dublin core path	OGC Name
title	title of the data product specification	dc:title	Title
name	Official designation of the data product	dc:identifier	Identifier
URL	online-address where the resource is downloadable		
content	Textual description of the content of any dataset compliant with the considering specification	dct:abstract	Abstract
specificPurpose	specific purpose for which the data shall be or has been collected	dc:subject	Subject
acronym	acronym of the data product	Not registered	
edition	version of the data product specification	Not registered	
date	date the product specification was created / last updated	dc:date	Modified

Item name	Item description	Dublin core path	OGC Name
language	language(s) of the data product specification, e.g. translations	dc:language	
classification	classification code of the handling restriction on the data product specification	dc:rights	Rights
contact	party responsible for the data product specification	dc:publisher	Publisher
extent	Description of the spatial and temporal extent covered by the data product	dct:spatial	Envelop
dataSource	Identification of the kinds of data source usable to product datasets compliant with the considering specification	dc:relation	Source
productionProcess	Textual description of the production process applicable to the datasets compliant with the considering specification	Not registered	
maintenance	Textual description of the maintenance process applicable to the datasets compliant with the considering specification	Not registered	