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Geographic information — Rules for application schema

Information géographique — Règles de schéma d'application

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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. 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. www.iso.org/patents

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 211, *Geographic information/Geomatics.*

This second edition cancels and replaces the first edition (ISO 19109:2005).

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Introduction

Any description of reality is always an abstraction, always partial, and always just one of many possible "views", depending on the application field.

The widespread application of computers and geographic information systems (GIS) has led to an increased use of geographic data within multiple disciplines. With current technology as an enabler, society's reliance on such data is growing. Geographic datasets are increasingly being shared and exchanged. They are also used for purposes other than those for which they were produced.

To ensure that data will be understood by both computer systems and users, the data structures for data access and exchange must be fully documented. The interfaces between systems, therefore, need to be defined with respect to data and operations, using the methods standardized in this International Standard. For the construction of internal software and data storage within proprietary systems, any method may be used that enables the standardized interfaces to be supported.

An application schema provides the formal description of the data structure and content required by one or more applications. An application schema contains the descriptions of both geographic data and other related data. A fundamental concept of geographic data is the feature.

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Geographic information — Rules for application schema

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1 Scope

This International Standard defines rules for creating and documenting application schemas, including principles for the definition of features.

The scope of this International Standard includes the following:

— conceptual modelling of features and their properties from a universe of discourse;

— definition of application schemas;

— use of the conceptual schema language for application schemas;

— transition from the concepts in the conceptual model to the data types in the application schema;

— integration of standardized schemas from other ISO geographic information standards with the application schema.

The following are outside the scope:

— choice of one particular conceptual schema language for application schemas;

— definition of any particular application schema;

— representation of feature types and their properties in a feature catalogue;

— representation of metadata;

— rules for mapping one application schema to another;

— implementation of the application schema in a computer environment;

— computer system and application software design;

— programming.

2 Conformance

2.1 General

This International Standard defines 12 conformance classes shown in Tables 1 to 12, matching the 12 requirements classes described in Clauses 7 and 8. Any application schema claiming conformance to any requirements class in this International Standard shall pass all of the tests listed in the corresponding conformance class, which are described in detail in the abstract test suites in Annex A. Each test relates to one or more specific requirements, which are explicitly indicated in the description of the test.

2.2 Meta-model

Table 1 — Meta-model conformance class

Conformance class	/conf/general
Requirements	/req/general (Clause 7, Table 15)
Tests	All tests in A.2

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2.3 UML application schema

Table 2 — UML application schema conformance class

Conformance class	/conf/uml
Dependency	/conf/general (2.2)
Requirements	/req/uml (8.2, Table 16)
Tests	All tests in A.3

2.4 Profiling standard schema

Table 3 — Profiling standard schema conformance class

Conformance class	/conf/profile
Dependency	/conf/uml (2.3)
Requirements	/req/profile (8.3, Table 19)
Tests	All tests in A.4

2.5 Metadata

Table 4 — Metadata conformance class

Conformance class	/conf/metadata
Dependency	/conf/uml (2.3)
Requirements	/req/metadata (8.4, Table 20)
Tests	All tests in A.5

2.6 Quality

Table 5 — Quality conformance class

Conformance class	/conf/quality
Dependency	/conf/uml (2.3)
Requirements	/req/quality (8.5, Table 21)
Tests	All tests in A.6

2.7 Temporal

Table 6 — Temporal conformance class

Conformance class	/conf/temporal
Dependency	/conf/uml (2.3)
Requirements	/req/temporal (8.6, Table 23)
Tests	All tests in A.7

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2.8 Spatial

Table 7 — Spatial conformance class

Conformance class	/conf/spatial
Dependency	/conf/uml (2.3)
Requirements	/req/spatial (8.7, Table 25)
Tests	All tests in A.8

2.9 Coverages

Table 8 — Coverages conformance class

Conformance class	/conf/coverage
Dependency	/conf/uml (2.3)
Requirements	/req/coverage (8.8, Table 27)
Tests	All tests in A.9

2.10 Observations

Table 9 — Observations conformance class

Conformance class	/conf/observation
Dependency	/conf/uml (2.3)
Requirements	/req/observation (8.9, Table 29)
Tests	All tests in A.10

2.11 Spatial referencing by identifiers

Table 10 — Spatial referencing by identifiers conformance class

Conformance class	/conf/identifier
Dependency	/conf/uml (2.3)
Requirements	/req/identifier (8.10, Table 30)
Tests	All tests in A.11

2.12 Code list

Table 11 — Code list conformance class

Conformance class	/conf/codeList
Dependency	/conf/uml (2.3)
Requirements	/req/codeList (8.11, Table 31)
Tests	All tests in A.12

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2.13 Multi-lingual support

Table 12 — Multi-lingual support conformance class

Conformance class	/conf/multi-lingual
Dependency	/conf/uml (2.3)
Requirements	/req/multi-lingual (8.12, Table 32)
Tests	All tests in A.13

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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.

IETF RFC 5646 (2009), *Tags for Identifying Languages, available at <https://www.rfc-editor.org/info/rfc5646>*

ISO 19103:2015, *Geographic information — Conceptual schema language*

ISO 19107:2003, *Geographic information — Spatial schema*

ISO 19108:2002, *Geographic information — Temporal schema*

ISO 19112:2003, *Geographic information — Spatial referencing by geographic identifiers*

ISO 19115-1:2014, *Geographic information — Metadata — Part 1: Fundamentals*

ISO 19115-2:2009, *Geographic information — Metadata — Part 2: Extensions for imagery and gridded data*

ISO 19123:2005, *Geographic information — Schema for coverage geometry and functions*

ISO 19156:2011, *Geographic information — Observations and measurements*

ISO 19157:2013, *Geographic information — Data quality*

ISO/IEC 19505-2:2012, *Information technology — Object Management Group Unified Modeling Language (OMG UML) — Part 2: Superstructure*

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

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

4.2
application schema
conceptual schema (4.5) for data required by one or more *applications* (4.1)

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

4.3
complex feature
feature (4.9) composed of other features

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