TECHNICAL SPECIFICATION

ISO/TS 19104

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Geographic information — Terminology

Information géographique — Terminologie

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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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 19104 was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

Introduction

This Technical Specification, along with a repository of geographic information system (GIS) terminology in the form of a terminological database, is expected to be a central reference for the shared language between participants and users alike. It defines the criteria for including concepts in the vocabulary, specifies the terminological data to be recorded, and, within the electronically processable repository, introduces an initial set of concepts with definitions that will be subject to ongoing maintenance.

This Technical Specification describes the structure of entries and the types of terminological data that are to be recorded. In addition, it includes principles for definition writing as outlined in ISO 10241 and ISO 704. The structure of a terminological record is given in Clause 7.

Geographic information — Terminology

1 Scope

This Technical Specification is applicable to international communication in the field of geographic information.

This Technical Specification provides the guidelines for collection and maintenance of terminology in the field of geographic information. It establishes criteria for selection of concepts to be included in other standards concerning geographic information, which are developed by ISO/TC 211, specifies the structure of the terminological record, and describes the principles for definition writing.

This Technical Specification also lays down the guidelines for maintenance of a Terminology Repository (see Annex A).

2 Conformance

Any product that claims conformance with this Technical Specification shall comply with the requirements described in the normative clauses and annexes.

Where a new term has been created for an existing concept, or an existing term has been incorrectly applied, the candidate document shall not be in conformance. Concepts and their definitions may be included with the candidate terms until conformance is demonstrated.

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

ISO 704, *Terminology work — Principles and methods*

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

ISO 10241, *International terminology standards — Preparation and layout*

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

4 Terms and definitions

The core list of terms and definitions from the ISO/TC 211 geographic information International Standards and Technical Specifications is given in Annex B.

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

4.1
abbreviation
designation formed by omitting words or letters from a longer form and designating the same **concept**

[ISO 1087-1:2000]

4.2
admitted term
term rated according to the scale of the term acceptability rating as a synonym for a **preferred term**

[ISO 1087-1:2000]

4.3
concept
unit of knowledge created by a unique combination of characteristics

[ISO 1087-1:2000]

NOTE Concepts are not necessarily bound to particular languages. They are, however, influenced by the social or cultural background which often leads to different categorizations.

4.4
concept harmonization
activity leading to the establishment of a correspondence between two or more closely related or overlapping **concepts** having professional, technical, scientific, social, economic, linguistic, cultural or other differences, in order to eliminate or reduce minor differences between them

[ISO 860:2007]

NOTE The purpose of concept harmonization is to improve communication.

4.5
concept system
set of **concepts** structured according to the relations among them

[ISO 1087-1:2000]

4.6
definition
representation of a **concept** by a descriptive statement which serves to differentiate it from related concepts

[ISO 1087-1:2000]

4.7
deprecated term
term rated according to the scale of the term acceptability rating as undesired

[ISO 1087-1:2000]

4.8
designation
designator
representation of a **concept** by a sign which denotes it

NOTE In terminology work, three types of designations are distinguished: symbols, appellations and **terms**.

[ISO 1087-1:2000]

4.9
extension
totality of **objects** to which a **concept** corresponds

[ISO 1087-1:2000]

4.10
language
system of signs for communications, usually consisting of vocabulary and rules

[ISO 5127-1]

NOTE In this Technical Specification, language refers to natural language or special languages but not to programming languages or artificial languages unless specifically identified.

4.11
language identifier
information in a terminological entry which indicates the name of a **language**

[ISO 1087-1:2000]

4.12
obsolete term
term which is no longer in common use

[ISO 1087-1:2000]

4.13
preferred term
term rated according to the scale of the term acceptability rating as the primary term for a given **concept**

[ISO 1087-1]

4.14
subordinate concept
narrower concept
concept which is either a specific concept or a partitive concept

[ISO 1087-1:2000]

4.15
term
verbal **designation** of a general **concept** in a specific subject field

[ISO 1087-1]

NOTE A term may contain symbols and can have variants, e.g. different forms of spelling.

4.16
term equivalent
term in another **language** which designates the same **concept**

NOTE A term equivalent should be accompanied by a **definition** of the designated concept expressed in the same language as the term equivalent.

4.17
term instance classification
classification identifying the status of a **term**

4.18
terminological record
structured collection of terminological data relevant to one **concept**

4.19
terminological record identifier
unique, unambiguous, and linguistically neutral identifier assigned to a **terminological record**

4.20
terminology repository
data store or document in which **terms** and their associated **definitions** are stored or recorded

5 Abbreviated terms

CD committee draft

DIS draft International Standard

FDIS final draft International Standard

GIS geographic information system

IT information technology

IUT implementation under test

ODP open distributed processing

PT project team

TC technical committee

TMG terminology maintenance group

WD working draft

WG working group

6 Criteria for the selection of concepts

Any concept requiring a definition for the clarity of reading of any of the ISO/TC 211 geographic information International Standards or Technical Specifications shall be included in that document and within Annex B of this Technical Specification, subject to the following conditions:

a) the term that represents the concept is not a trade name, name of research project, or colloquial term (local informal term to describe a formal term e.g. “guy” instead of “man”);

b) the concept is not selected if its definition in general language dictionaries corresponds to its definition in the field of geographic information;

c) only concepts with a single definition are included;

d) the concept is central to understanding the standard and is not self-explanatory.

7 Structure of the terminological record

7.1 Record content

The terminological record may contain the following terminological data fields, in the order listed below:

a) record number – a terminological record identifier;

b) entry language identifier – the code representing natural language utilized for the terminological record based on ISO 639-2;

c) preferred term;

d) abbreviation – if preferred, the abbreviation shall precede the full form, otherwise an abbreviated form shall follow the full form;

e) admitted term(s) – if these are national variants, they shall be followed by a code as defined in ISO 3166-1; the numeric 3-digit code is used for the IT interface (i.e. stored in the database), while the meaning of this code is presented in the human language used by the user (i.e. the human interface);

f) definition – if taken from another normative document, a reference shall be added in square brackets after the definition; or, if referring to another concept in the vocabulary, that concept shall be named by its preferred term and presented in bold face characters; the principles for definition writing are given in ISO 704 (see Annex C);

g) deprecated or obsolete terms (in alphabetical order);

h) references to related entries;

i) examples of term usage;

j) notes – may be used to provide additional information (if a definition has been adapted from a source, this may be explained in a note);

k) term instance status (for online repository only);

l) beginning date of the instance (for online repository only) (see ISO 19108);

m) ending date of the instance (for online repository only) (see ISO 19108).

Provision shall be made for specifying language identifiers and, if needed, country codes for equivalents in other languages.

7.2 Mandatory data fields

The following terminological data fields are mandatory for a terminological record. The rest of the data fields listed in 7.1 are optional.

a) entry number;

b) preferred term;

c) definition;

d) beginning date of the instance;

e) term instance status (for online repository only).

7.3 Term equivalents

Term equivalents in national languages may be submitted by national bodies and class A liaisons to the Terminology Maintenance Group for consideration. Term equivalents shall be preceded by:

a) the numeric 3 character country code as defined in ISO 3166-1, if needed;

b) the language code as defined in ISO 639-2 (e.g. “fra” for French, “deu” for German);

Annex A
(normative)

Maintenance of the Terminology Repository

A.1 Introduction

A Terminology Repository will be maintained by the TMG, see A.3.1. Maintenance mechanisms have been developed that will

— enable proposed terms (and their associated definitions) to be added to, or amended in, the Terminology Repository as required, and

— facilitate the assessment and harmonization of proposed terms prior to their parent draft standards becoming final.

A.2 Terminology Repository

A.2.1 Overview

A Terminology Repository shall be maintained for ISO geographic information standards.

The Terminology Repository shall take the form of an online computer database.

Online read-only access will be available to all ISO/TC 211 members. Write and update access will be available to WG convenors, PT leaders and editors. Public access to terms and definition that appear in published ISO/TC 211 International Standards shall be made available. All terms (existing and proposed) defined in ISO geographic information standards and drafts shall be included in the Terminology Repository.

A.2.2 Terminology entry and update

The relevant WG convenor or PT leader will be responsible for electronically submitting all terms and definitions from a new ISO geographic information standard WD, CD, DIS or FDIS to the Repository. The person responsible for entering the term shall also be responsible for entering the status of the term and any related useful terms from outside ISO/TC 211.

All concepts, terms and definitions submitted to the Terminology Repository shall satisfy the criteria for the selection of concepts as specified in Clause 6.

All terminological records shall be structured as specified in Clause 7.

At the time of entry to the Repository, terms shall be classified as being Candidate, regardless of whether the same term is classified as being Draft or Harmonized elsewhere in the Repository.

A.2.3 Attribution and classification of terms

Every term in the Terminology Repository shall be accompanied by its parent document's ISO standard number (for example, ISO 19107) where applicable, the document type (for example, WD or CD) and the date of entry. A term may also have a status type indicating that it is to be deleted or requires harmonization. Specific fields will be included in each Terminology Repository record to accommodate this information.

Each term in the Terminology Repository shall be assigned one of the following six status types.

— Candidate – newly entered term, or a term that is associated with multiple definitions and/or concepts.

— Draft – term that appears in a single draft ISO geographic information standard and that conforms to the "one term, one definition, one concept" principle.

— Harmonized – term that appears in multiple ISO geographic information draft standards but for which the "one term, one definition, one concept" principle has been negotiated by the relevant working groups.

— Normative – term that has already been published in an International Standard or Technical Specification and does not conflict with the terms and definitions in the ISO geographic information standards.

— Normative/Conflict – term that has been published in more than one International Standard or Technical Specification with different definitions in different standards.

— Deleted – term that has been identified for deletion from the repository.

These status types will be assigned to a code list to be referred to as "term instance classification" as illustrated in Table A.1.

Table A.1 — Term instance status

Instance status code	Status type
001	Candidate
002	Draft
003	Harmonized
004	Normative
005	Normative/Conflict
006	Deleted

Progression of a term from Candidate to Draft to Harmonized status will depend on either

— an assessment by the TMG, or

— harmonization consultations between affected working groups.

Draft or Harmonized status indicates that significant stability has been achieved as regards the term and its definition. Progression to Normative status can only occur when the term, with its associated definition, is published in an International Standard or Technical Specification.

A.2.4 Authority of the Terminology Repository

The Terminology Repository and its associated maintenance processes are not a substitute for normal ISO practices in relation to standards development. The Repository provides a summary for existing and proposed ISO/TC 211 terminology and helps facilitate harmonization where necessary. The Candidate, Draft and Harmonized status types have no official meaning or authority beyond the Terminology Repository.

A.3 Terminology status review process

A.3.1 Terminology Maintenance Group (TMG)

Assessment of Candidate terms shall be the responsibility of the TMG.

The TMG shall comprise:

— a convenor;

— at least two members from each ISO/TC 211 working group (preferably representing different national bodies); ideally there should be more than one language represented;

— additional members as necessary to ensure the representation of at least two languages, the inclusion of terminology expertise and the engagement of national bodies and liaisons.

Membership of the TMG shall be for a two-year term or for the balance of a two-year term in the case of a working group that is established part-way through a term. Each term shall commence on 1st January of even-numbered years (2002, 2004, etc.). Members of the TMG will be eligible for reappointment for further terms.

In the event of a working group being dissolved (for example, as a result of all its work items being completed), the representatives from the working group shall remain members of the TMG until all related terminology issues have been resolved. They will then withdraw.

In the event of all working groups being dissolved, the chair of ISO/TC 211, upon the completion of all related terminology work, shall suspend the TMG until such time as new work items are introduced.

A.3.2 Responsibilities

The Chair of ISO/TC 211 shall be responsible for ensuring the existence of the TMG and for nominating the convenor.

Each ISO/TC 211 working group leader shall be responsible for nominating representatives to the TMG and for advising the convenor of the availability of relevant new documents.

The convenor shall be responsible for the operation of the TMG.

The convenor shall be responsible for advising members of the TMG regarding the availability of new documents and for ensuring the update of the status of terms.

A.3.3 Assessment by TMG

A.3.3.1 Objective

The TMG shall review Candidate terms within two months of receipt. The objective of the review shall be to ensure that Candidate terms conform to the “one term, one definition, one concept” criterion (i.e. a one-to-one correspondence between a term and a concept, and a one-to-one association between a definition and a concept) and do not conflict with existing terminology. Candidate terms that satisfy the criterion shall be nominated as Draft terms pending their publication in an International Standard or Technical Specification. Candidate terms that do not satisfy the criterion shall retain their Candidate status and be referred for harmonization. The TMG will work online whenever possible and, when necessary, convene meetings in accordance with the ISO directives.

NOTE In instances where a Candidate term/definition conflicts with an existing Draft term/definition, the existing term/definition shall retain its status pending harmonization deliberations.

A.3.3.2 Candidate terms

The review process shall consider each Candidate term individually and shall proceed as follows.

a) Perform Concept, Structure and Circularity Tests;

   1) Determine if the criteria for the selection of concepts in Clause 6 have been satisfied.

   2) Determine if the terminological record is currently structured in the parent document according to Clause 7.

   3) Determine if the definition can be understood and is non-circular.

   4) Refer terms from working drafts that fail to satisfy the above requirements back to the appropriate working group for correction. Terms from committee drafts or later that fail to satisfy the above requirements will be referred back through appropriate national body comments.

b) Perform the “One Concept, One Definition” Test;

1) Determine if there are other records for the same concept in the Repository originating from other standards or earlier drafts of the standard in question. If yes, extract all definition records for the concept from the Repository. If no, classify the concept as having satisfied the “One Concept, One Definition” criterion but requiring “One Term, One Concept” testing.

2) If a record for the same concept, originating from an earlier draft of the same standard, has been extracted from the Repository, determine if the definitions are identical. If yes, classify the earlier record for removal from the Repository. If no, retain the concept's Candidate status and document the need for harmonization with other standards that have adopted the definition in the earlier draft.

3) If other records for the same concept, originating from other draft standards, have been extracted from the Repository, determine if all definitions are identical to those of the Candidate term. If yes, reclassify the Candidate concept as Draft. If no, retain the concept's Candidate status and document the need for harmonization.

4) If other records for the same concept, originating from published International Standards or Technical Specifications, have been extracted from the Repository, determine if all definitions are identical to those of the Candidate concept. If yes, the concept is already Normative. Ensure that cross-referencing is correct. If no, retain the concept's Candidate status and document the need for harmonization.

c) Perform the “One Term, One Concept” Test;

Each Candidate term that has not previously appeared in other standards or earlier drafts of the standard in question will be subjected to a “One Term, One Concept” test by members of the TMG. The members shall individually examine the Terminology Repository to determine whether the concept described by the definition is already adequately described by another term. Consultation with relevant working groups will be required. If an alternative term exists, retain the term's Candidate status and classify it as requiring harmonization. Do not change the status of the alternative term. If no alternative term is identified, classify the term as being Draft.

A.3.3.3 Normative terms

A working draft or committee draft may include normative terms that have been adopted from other International Standards. The TMG shall review these terms to ensure that they harmonize with ISO 19100 series concepts and terminology. The TMG shall refer any problems to the appropriate working group or editing committee (in the latter case through national body comments).

A.3.3.4 Deleted terms

The test for deleted terms is to be performed if the terminology from an earlier draft of the standard has been entered into the Terminology Repository.

— For each item in the earlier draft, check if an identical Candidate term occurs in the current draft.

— If a Candidate term does not exist in the current draft, check if the term appears in other standards.

— If a Candidate term does not exist in the current draft and the term does not appear in other standards, classify the term and its definition as deleted in the Terminology Repository.

Terms that have been specifically nominated for deletion shall be classified accordingly in the Terminology Repository. ISO/TC 211 shall be formally advised of the intention to delete the terms. Deletion shall take place following a plenary meeting of ISO/TC 211.

A.3.4 Harmonization

Candidate terms that require harmonization shall be directly referred to the appropriate working groups. In addition, where the source document is at CD or DIS, the convenor of the TMG shall identify terminology harmonization issues in comments formally forwarded to the TC secretariat.

It is expected that harmonization issues will mostly occur in working drafts and early committee drafts. The TMG will facilitate discussions between the interested parties (generally via e-mail) to achieve a resolution of the issues. Should resolution not be possible within the period allowed for consideration and comment, the TMG convenor will call a meeting at the next ISO/TC 211 plenary to resolve the issues.

A.3.5 Revision of terminology status

In instances where there is consensus in relation to the harmonization of the term, the term shall be reclassified as Harmonized pending publication in an ISO standard.

In instances where there is consensus as regards the retention or deletion of a term nominated for deletion, the term shall be retained or classified as deleted in the Terminology Repository as appropriate.

Any terms for which consensus cannot be achieved during the consultation process will retain their Candidate status and will be considered further by the relevant ISO/TC 211 working groups. The TMG will facilitate this process. The TMG will not make decisions about the definitions to be adopted for concepts but may make recommendations to the working groups.

A.3.6 Additional terms

There will be instances where it will be desirable to include terms from documents other than ISO/TC 211 sponsored standards. In such cases, the following will apply.

— The nomination of additional terms will only be accepted from ISO/TC 211 members and liaisons.

— The inclusion of any proposed term, definition and concept shall be driven by a clear business need. Unnecessary proliferation of terminology will be discouraged.

— Every proposal shall be submitted to the TMG in English. The proposal shall include the term, its definition, a description of the associated concept, and the relationship to existing ISO/TC 211 terms and/or concepts. A description of the business driver shall also be included.

— The TMG will issue an ISO/TC 211 document containing details of the proposal. This will be circulated to members for comment through the ISO/TC 211 Secretariat. The period for submitting comments will be one month. Comment resolution processes will subsequently be implemented.

— The decision to accept or reject the proposed record will be taken by resolution of ISO/TC 211 at the next Plenary meeting.

Annex B
(normative)

Terms and definitions from ISO/TC 211 International Standards and Technical Specifications

This list of terms has been compiled from International Standards and Technical Specifications developed by ISO/TC 211 and other sources. Its purpose is to encourage consistency in the use and interpretation of geospatial terms. It is freely available for use by all interested people and organizations.

NOTE In notes and examples below, references to International Standards and Technical Specifications refer to the source document.

B.1
abbreviation
designation (B.132) formed by omitting words or letters from a longer form and designating the same **concept** (B.60)

[ISO 1087-1:2000]

B.2
abstract test case
generalized test for a particular requirement

NOTE An abstract test case is a formal basis for deriving **executable test cases** (B.171). One or more test purposes are encapsulated in the abstract test case. An abstract test case is independent of both the **implementation** (B.244) and the **values** (B.515). It should be complete in the sense that it is sufficient to enable a test verdict to be assigned unambiguously to each potentially observable test outcome [i.e. **sequence** (B.425) of test **events** (B.170)].

[ISO 19105:2000]

B.3
abstract test method
method (B.312) for testing **implementation** (B.244) independent of any particular test procedure

[ISO 19105:2000]

B.4
abstract test module
set (B.433) of related **abstract test cases** (B.2)

NOTE Abstract test modules may be nested in a hierarchical way.

[ISO 19105:2000]

B.5
ATS
abstract test suite
abstract test module (B.4) specifying all the requirements to be satisfied for **conformance** (B.67)

NOTE Abstract test suites are described in a **conformance clause** (B.69).

[ISO 19105:2000]

B.6
acceptance testing
〈user〉 process of determining whether an **implementation** (B.244) satisfies acceptance criteria and enables the **user** (B.512) to determine whether to accept the implementation

NOTE 1 This includes the planning and execution of several kinds of tests (e.g. functional, volume, performance tests) that demonstrate that the implementation satisfies the user requirements.

NOTE 2 This is not a part of **conformance testing** (B.73).

[ISO 19105:2000]

B.7
accuracy
closeness of agreement between a test result and the accepted reference **value** (B.515)

NOTE A test result can be observations or **measurements** (B.301).

[ISO 3534-1:1993]

B.8
active object
object (B.326) that is capable of independent actions, and therefore of initiating interactions between itself and other objects without immediate prior external stimulation

NOTE 1 See **passive object** (B.341)

NOTE 2 An active object can represent a **user** (B.512) or an active **service** (B.427) that depends on internal (and therefore not visible) triggers to start actions. Active and passive **states** (B.452) can exist for the same object, and such a service can transition between these two states depending on invocation of an activation or deactivation **operation** (B.332) protocol.

[ISO 19132:2007]

B.9
actor
〈UML〉 coherent **set** (B.433) of roles that users of use cases play when interacting with these use cases

NOTE An actor may be considered to play a separate role with regard to each use case with which it communicates.

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.10
admitted term
term (B.475) rated according to the scale of the term acceptability rating as a synonym for a **preferred term** (B.369)

[ISO 1087-1:2000]

B.11
affine coordinate system
coordinate system (B.90) in Euclidean space with straight axes that are not necessarily mutually perpendicular

[ISO 19111:2007]

B.12
aggregation
〈UML〉 special form of **association** (B.16) that specifies a whole-part **relationship** (B.395) between the aggregate (whole) and a **component** (B.50) part

NOTE See **composition** (B.54).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.13
annotation
any marking on illustrative material for the purpose of **clarification** (B.39)

NOTE Numbers, letters, symbols, and signs are examples of annotation.

[ISO 19117:2005]

B.14
application
manipulation and processing of **data** (B.103) in support of **user** (B.512) requirements

[ISO 19101:2002]

B.15
application schema
conceptual schema (B.65) for **data** (B.103) required by one or more **applications** (B.14)

[ISO 19101:2002]

B.16
association
〈UML〉 semantic **relationship** (B.395) between two or more **classifiers** (B.41) that specifies connections among their **instances** (B.254)

NOTE A binary association is an association among exactly two classifiers (including the possibility of an association from a classifier to itself).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.17
attitude
orientation of a body, described by the angles between the axes of that body's **coordinate system** (B.90) and the axes of an external coordinate system

NOTE In positioning **services** (B.427), this is usually the orientation of the user's platform, such as an aircraft, boat, or automobile.

[ISO 19116:2004]

B.18
attribute

〈UML〉 **feature** (B.179) within a **classifier** (B.41) that describes a **range** (B.381) of **values** (B.515) that **instances** (B.254) of the classifier may hold

NOTE 1 An attribute is semantically equivalent to a **composition** (B.54) **association** (B.16); however, the intent and usage is normally different.

NOTE 2 "Feature" used in this **definition** (B.126) is the UML meaning of the **term** (B.475) and is not meant as defined in 4.1 of this Technical Specification.

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.19
attribute

〈XML〉 name-value pair contained in an **element** (B.153)

NOTE In this document, an attribute is an XML attribute unless otherwise specified. The syntax of an XML attribute is "Attribute::= Name = AttValue". An attribute typically acts as an XML element modifier (e.g. <Road gml:id = "r1" />; here gml:id is an attribute).

[ISO 19136:2007]

B.20
bag

finite, unordered collection of related **items** (B.269) [**objects** (B.326) or **values** (B.515)] that may be repeated

NOTE Logically, a bag is a **set** (B.433) of pairs <item, count>.

[ISO 19107:2003]

B.21
band

range (B.381) of wavelengths of electromagnetic radiation that produce a single **response** (B.403) by a sensing device

[ISO/TS 19101-2:2008]

B.22
base representation

〈moving features〉 representation, using a local origin and local ordinate **vectors** (B.517), of a **geometric object** (B.219) at a given reference time

NOTE 1 A rigid geometric object may undergo translation or rotation, but remains congruent with its base representation.

NOTE 2 The local origin and ordinate vectors establish an **engineering coordinate reference system** (B.164) (ISO 19111), also called a local frame or a local Euclidean **coordinate system** (B.90).

[ISO 19141:2008]

B.23
base standard
ISO **geographic information** (B.211) standard or other **information** (B.250) technology standard issued as a source from which a **profile** (B.374) may be constructed

[ISO 19106:2004]

B.24
basic service
service (B.427) providing a basic **function** (B.194) to other services or **applications** (B.14) in a functional manner

NOTE 1 See **interoperate** (B.264)

NOTE 2 Basic services lack any persistent, user-specific **state** (B.452) **information** (B.250) between invocations and are not meant for direct access by **users** (B.512). Because they act in a functional manner, they are readily replaceable at runtime by other services using the same **interfaces** (B.260).

[ISO 19132:2007]

B.25
basic test
initial **capability test** (B.33) intended to identify clear cases of **non-conformance** (B.324)

[ISO 19105:2000]

B.26
behaviour
〈UML〉 observable effects of an **operation** (B.333) or **event** (B.170), including its results

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.27
boundary
set (B.433) that represents the limit of an entity

NOTE Boundary is most commonly used in the context of geometry, where the set is a collection of **points** (B.352) or a collection of **objects** (B.326) that represent those points. In other arenas, the **term** (B.475) is used metaphorically to describe the transition between an entity and the rest of its **domain** (B.149) of discourse.

[ISO 19107:2003]

B.28
buffer
geometric object (B.219) that contains all **direct positions** (B.138) whose distance from a specified geometric **object** (B.326) is less than or equal to a given distance

[ISO 19107:2003]

B.29
calendar
discrete **temporal reference system** (B.473) that provides a basis for defining **temporal position** (B.472) to a resolution of one **day** (B.125)

[ISO 19108:2002]

B.30
calendar era
sequence (B.425) of **periods** (B.345) of one of the **types** (B.503) used in a **calendar** (B.29), counted from a specified **event** (B.170)

[ISO 19108:2002]

B.31
calibration
process of quantitatively defining a system's **responses** (B.403) to known, controlled signal inputs

[ISO/TS 19101-2:2008]

B.32
candidate route
any **route** (B.409) that satisfies all **constraints** (B.76) of the **routing** (B.412) **request** (B.399) with the possible exception of optimality of the **cost function** (B.95)

NOTE **Navigation** (B.319) is the process of finding the candidate route that optimizes a chosen cost function.

[ISO 19133:2005]

B.33
capability test
test designed to determine whether an IUT conforms to a particular characteristic of an International Standard as described in the test purpose

[ISO 19105:2000]

B.34
cardinality
〈UML〉 number of **elements** (B.153) in a **set** (B.433)

NOTE Contrast: **multiplicity** (B.317).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.35
Cartesian coordinate system
coordinate system (B.90) which gives the **position** (B.365) of **points** (B.352) relative to n mutually perpendicular axes

NOTE n is 1, 2 or 3 for the purposes of this International Standard.

[ISO 19111:2007]

B.36
character
member of a **set** (B.433) of **elements** (B.153) that is used for the representation, organization, or control of **data** (B.103)

[ISO/IEC 2382-1:1993]

B.37
child element
〈XML〉 immediate descendant **element** (B.153) of an element

[ISO 19136:2007]

B.38
circular sequence
sequence (B.425) which has no logical beginning and is therefore equivalent to any circular shift of itself; hence, the last **item** (B.269) in the sequence is considered to precede the first item in the sequence

[ISO 19107:2003]

B.39
clarification
non-substantive change to a **register** (B.390) **item** (B.269)

NOTE A non-substantive change does not change the semantics or technical meaning of the item. Clarification does not result in a change to the **registration** (B.393) status of the register item.

[ISO 19135:2005]

B.40
class
〈UML〉 description of a **set** (B.433) of **objects** (B.326) that share the same **attributes** (B.18), **operations** (B.333), **methods** (B.312), **relationships** (B.395), and semantics

NOTE A class may use a set of **interfaces** (B.261) to specify collections of operations it provides to its environment.

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.41
classifier
〈UML〉 mechanism that describes behavioural and structural **feature** (B.179)

NOTE Classifiers include **interfaces** (B.261), **classes** (B.40), datatypes, and **components** (B.50).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.42
client
software **component** (B.50) that can invoke an **operation** (B.332) from a **server** (B.426)

[ISO 19128:2005]

B.43
closure
union of the **interior** (B.262) and **boundary** (B.27) of a **topological** (B.489) or **geometric object** (B.219)

[ISO 19107:2003]

B.44
cluster
collection of **targets** (B.465), potentially heterogeneous (each satisfying a different query criteria), whose **locations** (B.291) fall within a small **neighbourhood** (B.321)

[ISO 19132:2007]

B.45
coboundary
set (B.433) of **topological primitives** (B.490) of higher **topological dimension** (B.487) associated with a particular **topological object** (B.489), such that this topological object is in each of their boundaries

NOTE If a **node** (B.323) is on the **boundary** (B.27) of an **edge** (B.151), that edge is on the coboundary of that node. Any orientation parameter associated to one of these relations would also be associated to the other. So that if the node is the **end node** (B.162) of the edge [defined as the end of the positive **directed edge** (B.139)], then the positive orientation of the node [defined as the positive **directed node** (B.141)] would have the edge on its coboundary (see ISO 19107:2003, Figure 35).

[ISO 19107:2003]

B.46
code
representation of a label according to a specified scheme

[ISO 19118:2005]

B.47
codelist
value domain (B.516) including a **code** (B.46) for each permissible **value** (B.515)

[ISO 19136:2007]

B.48
codespace
rule or authority for a **code** (B.46), name, **term** (B.475) or category

EXAMPLE Examples of codespaces include dictionaries, authorities, **codelists** (B.47), etc.

[ISO 19136:2007]

B.49
complex feature
feature (B.179) composed of other features

[ISO 19109:2005]

B.50
component
〈UML〉 modular, deployable, and replaceable part of a system that encapsulates **implementation** (B.244) and exposes a **set** (B.433) of **interfaces** (B.261)

NOTE A component represents a physical piece of implementation of a system, including software **code** (B.46) (source, binary or executable) or equivalents such as scripts or command files.

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.51
composite curve
sequence (B.425) of **curves** (B.99) such that each curve (except the first) starts at the **end point** (B.163) of the previous curve in the sequence

NOTE A composite curve, as a **set** (B.433) of **direct positions** (B.138), has all the properties of a curve.

[ISO 19107:2003]

B.52
composite solid
connected (B.74) **set** (B.433) of **solids** (B.438) adjoining one another along shared **boundary** (B.27) **surfaces** (B.460)

NOTE A composite solid, as a set of **direct positions** (B.138), has all the properties of a solid.

[ISO 19107:2003]

B.53
composite surface
connected (B.74) **set** (B.433) of **surfaces** (B.460) adjoining one another along shared **boundary** (B.27) **curves** (B.99)

NOTE A composite surface, as a set of **direct positions** (B.138), has all the properties of a surface.

[ISO 19107:2003]

B.54
composition
〈UML〉 form of **aggregation** (B.12) which requires that a part **instance** (B.254) be included in at most one composite at a time, and that the composite **object** (B.326) be responsible for the creation and destruction of the parts

NOTE Parts with non-fixed **multiplicity** (B.317) may be created after the composite itself, but, once created, they live and die with it (i.e. they share lifetimes). Such parts can also be explicitly removed before the death of the composite. Composition may be recursive. Synonym: composite aggregation.

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.55
compound coordinate reference system
coordinate reference system (B.88) using at least two independent coordinate reference systems

NOTE Coordinate reference systems are independent of each other if **coordinate** (B.84) **values** (B.515) in one cannot be converted or transformed into coordinate values in the other.

[ISO 19111:2007]

B.56
computational geometry
manipulation of, and calculations with, geometric representations for the **implementation** (B.244) of geometric **operations** (B.332)

EXAMPLE Computational geometry operations include testing for geometric inclusion or intersection, the calculation of **convex hulls** (B.82) or **buffer** (B.28) zones, or the finding of shortest distances between **geometric objects** (B.219).

[ISO 19107:2003]

B.57
computational topology
topological **concepts** (B.60), structures and algebra that aid, enhance or define **operations** (B.332) on **topological objects** (B.489) usually performed in **computational geometry** (B.56)

[ISO 19107:2003]

B.58
computational viewpoint
viewpoint (B.526) on a system and its environment that enables distribution through functional decomposition of the system into **objects** (B.326) which interact at **interfaces** (B.260)

[ISO 19119:2005]

B.59
concatenated operation
coordinate operation (B.87) consisting of sequential **application** (B.14) of multiple coordinate operations

[ISO 19111:2007]

B.60
concept
unit (B.507) of knowledge created by a unique combination of characteristics

NOTE Concepts are not necessarily bound to particular **languages** (B.275). They are, however, influenced by the social or cultural background which often leads to different categorizations.

[ISO 1087-1:2000]

B.61
concept harmonization
activity leading to the establishment of a correspondence between two or more closely related or overlapping **concepts** (B.60) having professional, technical, scientific, social, economic, linguistic, cultural or other differences, in order to eliminate or reduce minor differences between them

NOTE The purpose of concept harmonization is to improve communication.

[ISO 860:2007]

B.62
concept system
set (B.433) of **concepts** (B.60) structured according to the relations among them

[ISO 1087-1:2000]

B.63
conceptual formalism
set (B.433) of modelling **concepts** (B.60) used to describe a **conceptual model** (B.64)

EXAMPLE UML meta model, EXPRESS meta model.

NOTE One conceptual formalism can be expressed in several **conceptual schema languages** (B.66).

[ISO 19101:2002]

B.64
conceptual model
model (B.314) that defines **concepts** (B.60) of a **universe of discourse** (B.511)

[ISO 19101:2002]

B.65
conceptual schema
formal description of a **conceptual model** (B.64)

[ISO 19101:2002]

B.66
conceptual schema language
formal **language** (B.275) based on a **conceptual formalism** (B.63) for the purpose of representing **conceptual schemas** (B.65)

EXAMPLE UML, EXPRESS, IDEF1X

NOTE A conceptual schema language may be lexical or graphical. Several conceptual schema languages can be based on the same conceptual formalism.

[ISO 19101:2002]

B.67
conformance
fulfilment of specified requirements

[ISO 19105:2000]

B.68
conformance assessment process
process for assessing the **conformance** (B.67) of an **implementation** (B.244) to an International Standard

[ISO 19105:2000]

B.69
conformance clause
clause defining what is necessary in order to meet the requirements of the International Standard

[ISO 19105:2000]

B.70
conformance implementation
implementation (B.244) that satisfies the requirements

[ISO 19105:2000]

B.71
conformance quality level
threshold **value** (B.515) or **set** (B.433) of threshold values for **data quality results** (B.115) used to determine how well a **dataset** (B.122) meets the criteria set forth in its **product specification** (B.373) or **user** (B.512) requirements

[ISO 19114:2003]

B.72
conformance test report
summary of the **conformance** (B.67) to the International Standard as well as all the details of the testing that supports the given overall summary

[ISO 19105:2000]

B.73
conformance testing
testing of a product to determine the extent to which the product is a conforming **implementation** (B.244)

[ISO 19105:2000]

B.74
connected
property of a **geometric object** (B.219) implying that any two **direct positions** (B.138) on the **object** (B.326) can be placed on a **curve** (B.99) that remains totally within the object

NOTE A **topological object** (B.489) is connected if and only if all its **geometric realizations** (B.221) are connected. This is not included as a **definition** (B.126) because it follows from a theorem of topology.

[ISO 19107:2003]

B.75
connected node
node (B.323) that starts or ends one or more **edges** (B.151)

[ISO 19107:2003]

B.76
constraint
restriction on how a **link** (B.287) or **turn** (B.502) may be traversed by a **vehicle** (B.519), such as **vehicle classification** (B.520), physical or temporal constraint

[ISO 19133:2005]

B.77
constraint
〈UML〉 semantic condition or restriction

NOTE **Domains** (B.149) are used to define the domain **set** (B.433) and **range** (B.382) set of **attributes** (B.18), operators and **functions** (B.194).

[ISO/TC 19103:2005 – adapted from ISO/IEC 19501]

B.78
continuous change
change in an **attribute** (B.18) whose **type** (B.503) has a **distance measure** (B.147) such that its **value** (B.515) can be assumed to take on intermediate values between two known **measurements** (B.301)

NOTE The interpolation of continuous change is usually done by taking into consideration **constraints** (B.76) on the "curve" joining the two data **points** (B.352) (time1, value1) and (time2, value2), looking at the value as a **function** (B.194) of time. For example, if the continuous change is for the **motion** (B.316) of a **vehicle** (B.519), then the constraints of physics and of the paths appropriate for that vehicle must be taken into consideration.

[ISO 19132:2007]

B.79
continuous coverage
coverage (B.97) that returns different **values** (B.515) for the same **feature attribute** (B.181) at different **direct positions** (B.138) within a single **spatial object** (B.442), temporal **object** (B.326), or **spatiotemporal object** (B.447) in its **domain** (B.149)

NOTE Although the domain of a continuous coverage is ordinarily bounded in terms of its spatial and/or temporal extent, it can be subdivided into an infinite number of direct positions.

[ISO 19123:2005]

B.80
control body
group of technical experts that makes decisions regarding the content of a **register** (B.390)

[ISO 19135:2005]

B.81
conversion rule
rule for converting **instances** (B.253) in the input **data** (B.103) structure to instances in the output data structure

[ISO 19118:2005]

B.82
convex hull
smallest **convex set** (B.83) containing a given **geometric object** (B.219)

NOTE "Smallest" is the **set** (B.433) theoretically smallest, not an indication of a **measurement** (B.301). The **definition** (B.126) can be rewritten as "the intersection of all convex sets that contain the geometric object".

[ISO 19107:2003 – adapted from Dictionary of Computing, Fourth Edition, Oxford University Press, 1996]

B.83
convex set
geometric set (B.222) in which any **direct position** (B.138) on the straight-line **segment** (B.419) joining any two direct positions in the geometric set is also contained in the geometric set

[ISO 19107:2003 – adapted from Dictionary of Computing, Fourth Edition, Oxford University Press, 1996]

B.84
coordinate
one of a **sequence** (B.425) of n numbers designating the **position** (B.365) of a **point** (B.352) in n-dimensional space

NOTE In a **coordinate reference system** (B.88), the coordinate numbers are qualified by **units** (B.507).

[ISO 19111:2007]

B.85
coordinate conversion
coordinate operation (B.87) in which both **coordinate reference systems** (B.88) are based on the same **datum** (B.124)

EXAMPLE Conversion from an ellipsoidal coordinate reference system based on the WGS84 datum to a Cartesian coordinate reference system also based on the WGS84 datum, or change of **units** (B.507) such as from radians to degrees or feet to metres.

NOTE A coordinate conversion uses parameters which have specified **values** (B.515) that are not determined empirically.

[ISO 19111:2007]

B.86
coordinate dimension
number of **measurements** (B.301) or axes needed to describe a **position** (B.365) in a **coordinate system** (B.90)

[ISO 19107:2003]

B.87
coordinate operation
change of **coordinates** (B.84), based on a one-to-one **relationship** (B.395), from one **coordinate reference system** (B.88) to another

NOTE Supertype of **coordinate transformation** (B.91) and **coordinate conversion** (B.85).

[ISO 19111:2007]

B.88
coordinate reference system
coordinate system (B.90) that is related to an **object** (B.326) by a **datum** (B.124)

NOTE For **geodetic** (B.202) and **vertical datums** (B.525), the object will be the Earth.

[ISO 19111:2007]

B.89
coordinate set
collection of **coordinate tuples** (B.92) related to the same **coordinate reference system** (B.88)

[ISO 19111:2007]

B.90
coordinate system
set (B.433) of mathematical rules for specifying how **coordinates** (B.84) are to be assigned to **points** (B.352)

[ISO 19111:2007]

B.91
coordinate transformation
coordinate operation (B.87) in which the two **coordinate reference systems** (B.88) are based on different **datums** (B.124)

NOTE A coordinate transformation uses parameters which are derived empirically by a **set** (B.433) of **points** (B.352) with known **coordinates** (B.84) in both coordinate reference systems.

[ISO 19111:2007]

B.92
coordinate tuple
tuple (B.501) composed of a **sequence** (B.425) of **coordinates** (B.84)

NOTE The number of coordinates in the coordinate tuple equals the dimension of the **coordinate system** (B.90); the order of coordinates in the coordinate tuple is identical to the order of the axes of the coordinate system.

[ISO 19111:2007]

B.93
Coordinated Universal Time
UTC
time scale maintained by the Bureau International des Poids et Mesures (International Bureau of Weights and Measures) and the International Earth Rotation Service (IERS) that forms the basis of a coordinated dissemination of standard frequencies and time

[ITU-R Rec.TF.686-1 (1997)]

B.94
correctness
correspondence with the **universe of discourse** (B.511)

[ISO/TS 19138:2006]

B.95
cost function
function (B.194) that associates a measure (cost) to a **route** (B.409)

NOTE The normal mechanism is to apply a cost to each part of a route, and to define the total route cost as the sum of the cost of the parts. This is necessary for the **operation** (B.332) of the most common **navigation** (B.319) algorithms. The **units** (B.507) of cost functions are not limited to monetary costs and values only, but include such measures as time, distance, and possibly others. The only requirement is that the function be additive and at least non-negative. This last criteria can be softened as long as no zero or less cost is associated with any loop in the **network** (B.322), as this will prevent the existence of a “minimal cost” route.

[ISO 19133:2005]

B.96
coupling
linkage of two or more software systems through **information** (B.250) transfer or messaging

NOTE 1 Compare with **integration** (B.259). While the **conceptual schema** (B.65) of the information transferred shall be agreed upon to some level, coupling **applications** (B.14) can be and are usually flexible in the **data** (B.103) representation of that information as long as the semantics content is correct and mappable to some canonical representation of the conceptual schema. The most common mapping technology used for XML messages is XSLT, and the transformation stylesheet can be supplied either by the **service broker** (B.428) or by the service provider. It is considered a best practice for a service provider to supply his functionality through several logically equivalent messaging APIs, each represented by a different URI linked to an XSLT transformation bridge, and implemented by the same internal **code** (B.46).

NOTE 2 Loose coupling and tight coupling are not at present well-defined **terms** (B.475) in the literature. Generally, “tight” coupling means that there is some sort of incurred dependency between requester and responder in the use of the **interface** (B.260), while “loose” means no such dependency. The nature of that dependency is not consistently defined between authors. In that light, “tight” coupling or “tight” integration are both bad practices, and have been viewed as such since the inception of the terms. Some literature refers to integration as “tight coupling”, but that is a less accurate description.

[ISO 19132:2007]

B.97
coverage
feature (B.179) that acts as a **function** (B.194) to return **values** (B.515) from its **range** (B.381) for any **direct position** (B.138) within its spatial, temporal or **spatiotemporal domain** (B.446)

EXAMPLE Examples include a **raster** (B.383) image, **polygon** (B.356) overlay or digital elevation matrix.

NOTE In other words, a coverage is a feature that has multiple values for each **attribute** (B.18) **type** (B.503), where each direct position within the geometric representation of the feature has a single value for each attribute type.

[ISO 19123:2005]

B.98
coverage geometry
configuration of the **domain** (B.149) of a **coverage** (B.97) described in **terms** (B.475) of **coordinates** (B.84)

[ISO 19123:2005]

B.99
curve
1-dimensional **geometric primitive** (B.220), representing the continuous image of a line

NOTE The **boundary** (B.27) of a curve is the **set** (B.433) of **points** (B.352) at either end of the curve. If the curve is a **cycle** (B.101), the two ends are identical, and the curve (if topologically closed) is considered not to have a boundary. The first point is called the **start point** (B.451), and the last is the **end point** (B.163). Connectivity of the curve is guaranteed by the “continuous image of a line” clause. A topological theorem states that a continuous image of a **connected** (B.74) set is connected.

[ISO 19107:2003]

B.100
curve segment
1-dimensional **geometric object** (B.219) used to represent a continuous **component** (B.50) of a **curve** (B.99) using homogeneous interpolation and **definition** (B.126) **methods** (B.312)

NOTE The **geometric set** (B.222) represented by a single curve segment is equivalent to a curve.

[ISO 19107:2003]

B.101
cycle
〈geometry〉 **spatial object** (B.442) without a **boundary** (B.27)

NOTE Cycles are used to describe boundary **components** (B.50) [see **shell** (B.434), **ring** (B.407)]. A cycle has no boundary because it closes on itself, but it is bounded (i.e. it does not have infinite extent). A circle or a sphere, for example, has no boundary, but is bounded.

[ISO 19107:2003]

B.102
cylindrical coordinate system
three-dimensional **coordinate system** (B.90) with two distance **coordinates** (B.84) and one angular coordinate

[ISO 19111:2007]

B.103
data
reinterpretable representation of **information** (B.250) in a formalized manner suitable for communication, interpretation, or processing

[ISO/IEC 2382-1:1993]

B.104
data element
unit (B.507) of **data** (B.103) that, in a certain context, is considered indivisible

[ISO 19118:2005]

B.105
data interchange
delivery, receipt and interpretation of **data** (B.103)

[ISO 19118:2005]

B.106
data level
level containing **data** (B.103) describing specific **instances** (B.253)

[ISO 19101:2002]

B.107
data product
dataset (B.122) or **dataset series** (B.123) that conforms to a **data product specification** (B.108)

[ISO 19131:2007]

B.108
data product specification
detailed description of a **dataset** (B.122) or **dataset series** (B.123) together with additional **information** (B.250) 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** (B.511) and a **specification** (B.448) for mapping the universe of discourse to a dataset. It may be used for production, sales, end-use or other purposes.

[ISO 19131:2007]

B.109
data quality basic measure
generic **data quality measure** (B.113) used as a basis for the creation of specific data quality measures

NOTE Data quality basic measures are abstract **data types** (B.121). They cannot be used directly when reporting data **quality** (B.377).

[ISO/TS 19138:2006]

B.110
data quality date
date or **range** (B.381) of dates on which a **data quality measure** (B.113) is applied

[ISO 19113:2002]

B.111
data quality element
quantitative **component** (B.50) documenting the **quality** (B.377) of a **dataset** (B.122)

NOTE The applicability of a data quality element to a dataset depends on both the dataset's content and its **product specification** (B.373); the result being that all **data elements** (B.104) may not be applicable to all datasets.

[ISO 19101:2002]

B.112
data quality evaluation procedure
operation(s) (B.332) used in applying and reporting **quality** (B.377) **evaluation** (B.169) **methods** (B.312) and their results

[ISO 19113:2002]

B.113
data quality measure
evaluation (B.169) of a **data quality subelement** (B.117)

EXAMPLE The percentage of the **values** (B.515) of an **attribute** (B.18) that are correct.

[ISO 19113:2002]

B.114
data quality overview element
non-quantitative **component** (B.50) documenting the **quality** (B.377) of a **dataset** (B.122)

NOTE **Information** (B.250) about the purpose, usage and lineage of a dataset is non-quantitative information.

[ISO 19101:2002]

B.115
data quality result
value (B.515) or **set** (B.433) of values resulting from applying a **data quality measure** (B.113) or the outcome of evaluating the obtained value or set of values against a specified **conformance quality level** (B.71)

EXAMPLE A data quality result of "90" with a **data quality value type** (B.118) of "percentage" reported for the **data quality element** (B.111) and its **data quality subelement** (B.117) "completeness, commission" is an example of a value resulting from applying a data quality measure to the data specified by a **data quality scope** (B.116). A data quality result of "true" with a data quality value type of "boolean variable" is an example of comparing the value (90) against a specified acceptable conformance quality level (85) and reporting an **evaluation** (B.169) of the kind "pass" or "fail".

[ISO 19113:2002]

B.116
data quality scope
extent or characteristic(s) of the **data** (B.103) for which **quality** (B.377) **information** (B.250) is reported

NOTE A data quality scope for a **dataset** (B.122) can comprise a **dataset series** (B.123) to which the dataset belongs, the dataset itself, or a smaller grouping of data located physically within the dataset, sharing common characteristics. Common characteristics can be an identified **feature** (B.179) **type** (B.503), **feature attribute** (B.181), or feature **relationship** (B.395); data collection criteria; original source; or a specified geographic or temporal extent.

[ISO 19113:2002]

B.117
data quality subelement
component (B.50) of a **data quality element** (B.111) describing a certain aspect of that data quality element

[ISO 19113:2002]

B.118
data quality value type
value (B.515) **type** (B.503) for reporting a **data quality result** (B.115)

EXAMPLE "boolean variable", "percentage", "ratio".

NOTE A data quality value type is always provided for a data quality result.

[ISO 19113:2002]

B.119
data quality value unit
value (B.515) **unit** (B.507) for reporting a **data quality result** (B.115)

EXAMPLE "metre".

NOTE A data quality value unit is provided only when applicable for a data quality result.

[ISO 19113:2002]

B.120
data transfer
movement of **data** (B.103) from one **point** (B.352) to another over a **medium** (B.304)

NOTE Transfer of **information** (B.250) implies transfer of data.

[ISO 19118:2005]

B.121
data type
specification (B.448) of a **value domain** (B.516) with **operations** (B.332) allowed on **values** (B.515) in this **domain** (B.149)

EXAMPLE Integer, Real, Boolean, String, Date and SG Point [conversion of **data** (B.103) into a series of **codes** (B.46)].

NOTE Data types include primitive predefined **types** (B.503) and user-definable types.

[ISO/TS 19103:2005]

B.122
dataset
identifiable collection of **data** (B.103)

NOTE A dataset may be a smaller grouping of data which, though limited by some **constraint** (B.76) such as spatial extent or **feature** (B.179) **type** (B.503), is located physically within a larger dataset. Theoretically, a dataset may be as small as a single feature or **feature attribute** (B.181) contained within a larger dataset. A hardcopy map or chart may be considered a dataset.

[ISO 19115:2003]

B.123
dataset series
collection of **datasets** (B.122) sharing the same **product specification** (B.373)

[ISO 19115:2003]

B.124
datum
parameter or **set** (B.433) of parameters that define the **position** (B.365) of the origin, the scale, and the orientation of a **coordinate system** (B.90)

[ISO 19111:2007]

B.125
day
period (B.345) having a duration nominally equivalent to the **periodic time** (B.346) of the Earth's rotation around its axis

[ISO 19108:2000]

B.126
definition
representation of a **concept** (B.60) by a descriptive statement which serves to differentiate it from related concepts

[ISO 1087-1:2000]

B.127
Delaunay triangulation
network (B.322) of triangles such that the circle passing through the vertices of any triangle does not contain, in its **interior** (B.262), the vertex of any other triangle

[ISO 19123:2005]

B.128
dependency
〈UML〉 **relationship** (B.395) between two modelling **elements** (B.153), in which a change to one modelling element (the independent element) will affect the other modelling element (the dependent element)

[ISO/TC 19103:2005 – adapted from ISO/IEC 19501]

B.129
deprecated term
term (B.475) rated according to the scale of the term acceptability rating as undesired

[ISO 1087-1:2000]

B.130
depth
distance of a **point** (B.352) from a chosen reference **surfaces** (B.460) measured downward along a line perpendicular to that surface

NOTE A depth above the reference surface will have a negative **value** (B.515).

[ISO 19111:2007]

B.131
design coordinate reference system
engineering coordinate reference system (B.164) in which the **base representation** (B.22) of a moving **object** (B.326) is specified

[ISO 19141:2008]

B.132
designation
designator
representation of a **concept** (B.60) by a sign which denotes it

NOTE In terminology work, three types of designations are distinguished: symbols, appellations and **terms** (B.475).

[ISO 1087-1:2000]

B.133
digital elevation model
dataset (B.122) of elevation **values** (B.515) that are assigned algorithmically to 2-dimensional **coordinates** (B.84)

[ISO/TS 19101-2:2008]

B.134
digital item
structured digital **object** (B.326) [asset, work, **service** (B.427), **data** (B.103) or **information** (B.250)] with a standard representation, identification and **metadata** (B.306) framework

NOTE Adapted from ISO/IEC TR 21000-1.

B.135
digital number
DN
integer **value** (B.515) representing a **measurement** (B.301) as detected by a **sensor** (B.423)

[ISO/TS 19101-2:2008]

B.136
Dijkstra graph
positively weighted directed **graph** (B.230) appropriately configured to execute a shortest path search

NOTE The **term** (B.475) comes from the most commonly known algorithm for finding a shortest path in a positively weighted graph, from E. Dijkstra's paper. Although this algorithm is not the only one in use, the requirements for the graph are common to most. The most common relaxation of the requirement is the “positive weights”, which are not needed in the Bellman–Ford algorithm.

[ISO 19133:2005]

B.137
direct evaluation method
method (B.312) of evaluating the **quality** (B.377) of a **dataset** (B.122) based on inspection of the **items** (B.269) within the dataset

[ISO 19114:2003]

B.138
direct position
position (B.365) described by a single **set** (B.433) of **coordinates** (B.84) within a **coordinate reference system** (B.88)

[ISO 19107:2003]

B.139
directed edge
directed topological object (B.143) that represents an **association** (B.16) between an **edge** (B.151) and one of its orientations

NOTE A directed edge that is in agreement with the orientation of the edge has a + orientation; otherwise, it has the opposite (–) orientation. Directed edge is used in topology to distinguish the right side (–) from the left side (+) of the same

edge and the **start node** (B.450) (–) and **end node** (B.162) (+) of the same edge, and in **computational topology** (B.57) to represent these **concepts** (B.60).

[ISO 19107:2003]

B.140
directed face

directed topological object (B.143) that represents an **association** (B.16) between a **face** (B.176) and one of its orientations

NOTE The orientation of the **directed edges** (B.139) that compose the **exterior** (B.174) **boundary** (B.27) of a directed face will appear positive from the direction of this **vector** (B.517); the orientation of a directed face that bounds a **topological solid** (B.491) will point away from the topological solid. Adjacent **solids** (B.438) would use different orientations for their shared boundary, consistent with the same sort of association between adjacent faces and their shared **edges** (B.151). Directed faces are used in the **coboundary** (B.45) relation to maintain the spatial association between face and edge.

[ISO 19107:2003]

B.141
directed node

directed topological object (B.143) that represents an **association** (B.16) between a **node** (B.323) and one of its orientations

NOTE Directed nodes are used in the **coboundary** (B.45) relation to maintain the spatial association between **edge** (B.151) and node. The orientation of a node is, with respect to an edge, "+" for **end node** (B.162), "–" for **start node** (B.450). This is consistent with the **vector** (B.517) notion of "result = end – start".

[ISO 19107:2003]

B.142
directed solid

directed topological object (B.143) that represents an **association** (B.16) between a **topological solid** (B.491) and one of its orientations

NOTE Directed solids are used in the **coboundary** (B.45) relation to maintain the spatial association between **face** (B.176) and topological solid. The orientation of a **solid** (B.438) is, with respect to a face, "+" if the up Normal is outward, "–" if it is inward. This is consistent with the concept of "up = outward" for a **surface** (B.460) bounding a solid.

[ISO 19107:2003]

B.143
directed topological object

topological object (B.489) that represents a logical **association** (B.16) between a **topological primitive** (B.490) and one of its orientations

[ISO 19107:2003]

B.144
discrete change

change in an **attribute** (B.18) **value** (B.515) such that it can be assumed to have changed without having taken intermediate values between two known **measurements** (B.301)

NOTE Legal changes of parcel changes are discrete, having occurred at a specific time.

[ISO 19132:2007]

B.145
discrete coverage
coverage (B.97) that returns the same **feature attribute** (B.181) **values** (B.515) for every **direct position** (B.138) within any single **spatial object** (B.442), temporal **object** (B.326), or **spatiotemporal object** (B.447) in its **domain** (B.149)

NOTE The domain of a discrete coverage consists of a finite **set** (B.433) of spatial, temporal, or spatiotemporal objects.

[ISO 19123:2005]

B.146
discrete spatiotemporal object
temporal sequence (B.474) of **object** (B.326) representations depicting the same spatial **feature** (B.179) at different times

NOTE See Theodoridis, 1999.

[ISO 19132:2007]

B.147
distance measure
distance metric
measure (B.303) of the pairs of **values** (B.515) of an **attribute** (B.18) **type** (B.503) that assigns a numeric value that is positive, symmetric and satisfies the triangular inequality

NOTE A measure "d" is positive if $d(x, y) > 0$ for every x, y where $x \neq y$ and $d(x,x) = 0$. A measure "d" is symmetric if $d(x, y) = d(y, x)$ for every x, y. A measure "d" satisfies the triangular inequality if $d(x, y) \leqslant d(x, a) + d(a, y)$ for every a, x and y. All numeric or **vector** (B.517) valued attributes have such a metric, the most common being the Euclidean metric based on the square root of the sum of the squares of the differences in each dimension. Other non-Euclidean metrics take "curvature of space" into account (such as along the **surface** (B.460) of the spheroid).

[ISO 19132:2007]

B.148
distribution transparency
property of hiding from a particular **user** (B.512) the potential **behaviour** (B.26) of some parts of a distributed system

[ISO/IEC 10746-2:1996]

B.149
domain
well-defined **set** (B.433)

NOTE Domains are used to define the domain set and **range** (B.381) set of **attributes** (B.18), operators and **functions** (B.194).

[ISO/TS 19103:2005]

B.150
easting
E

distance in a **coordinate system** (B.90), eastwards (positive) or westwards (negative) from a north-south reference line

[ISO 19111:2007]

B.151
edge
1-dimensional **topological primitive** (B.490)

NOTE The **geometric realization** (B.221) of an edge is a **curve** (B.99). The **boundary** (B.27) of an edge is the **set** (B.433) of one or two **nodes** (B.323) associated to the edge within a **topological complex** (B.486).

[ISO 19107:2003]

B.152
edge-node graph
graph (B.230) embedded within a **topological complex** (B.486) composed of all of the **edges** (B.151) and **connected nodes** (B.75) within that complex

NOTE The edge-node graph is a **subcomplex** (B.455) of the complex within which it is embedded.

[ISO 19107:2003]

B.153
element
〈XML〉 basic **information** (B.250) **item** (B.269) of an XML document containing **child elements** (B.37), **attributes** (B.19) and **character** (B.36) **data** (B.103)

NOTE From the XML Information Set: "Each XML document contains one or more elements, the boundaries of which are either delimited by start-tags and end-tags, or, for empty elements, by an empty-element **tag** (B.463). Each element has a **type** (B.503), identified by name, sometimes called its 'generic identifier' (GI), and may have a **set** (B.433) of attribute **specifications** (B.448). Each attribute specification has a name and a **value** (B.515)."

[ISO 19136:2007]

B.154
ellipsoid
surface (B.460) formed by the rotation of an ellipse about a main axis

NOTE In this International Standard, ellipsoids are always oblate, meaning that the axis of rotation is always the minor axis.

[ISO 19111:2007]

B.155
ellipsoidal coordinate system
geodetic coordinate system
coordinate system (B.90) in which **position** (B.365) is specified by **geodetic latitude** (B.204), **geodetic longitude** (B.205) and (in the three-dimensional case) **ellipsoidal height** (B.156)

[ISO 19111:2007]

B.156
ellipsoidal height
geodetic height
h
distance of a **point** (B.352) from the **ellipsoid** (B.154), measured along the perpendicular from the ellipsoid to this point, positive if upwards or outside of the ellipsoid

NOTE Only used as part of a three-dimensional **ellipsoidal coordinate system** (B.155) and never on its own.

[ISO 19111:2007]

B.157
ellipsoidal latitude
geodetic latitude
φ
angle from the equatorial plane to the perpendicular to the **ellipsoid** (B.154) through a given **point** (B.352), northwards treated as positive

[ISO 19111:2007]

B.158
ellipsoidal longitude
geodetic longitude
λ
angle from the **prime meridian** (B.370) plane to the **meridian** (B.305) plane of a given **point** (B.352), eastward treated as positive

[ISO 19111:2007]

B.159
encoding
conversion of **data** (B.103) into a series of **codes** (B.46)

[ISO 19118:2005]

B.160
encoding rule
identifiable collection of **conversion rules** (B.81) that define the **encoding** (B.159) for a particular **data** (B.103) structure

EXAMPLE XML, ISO 10303-21, ISO/IEC 8211.

NOTE An encoding rule specifies the types of data to be converted as well as the syntax, structure and **codes** (B.46) used in the resulting data structure.

[ISO 19118:2005]

B.161
encoding service
software **component** (B.50) that has an **encoding rule** (B.160) implemented

[ISO 19118:2005]

B.162
end node
node (B.323) in the **boundary** (B.27) of an **edge** (B.151) that corresponds to the **end point** (B.163) of that edge as a **curve** (B.99) in any valid **geometric realization** (B.221) of a **topological complex** (B.486) in which the edge is used

[ISO 19107:2003]

B.163
end point
last **point** (B.352) of a **curve** (B.99)

[ISO 19107:2005]

B.164
engineering coordinate reference system
coordinate reference system (B.88) based on an **engineering datum** (B.165)

EXAMPLE Local engineering and architectural **grids** (B.234); coordinate reference system local to a ship or an orbiting spacecraft.

[ISO 19111:2007]

B.165
engineering datum
local datum
datum (B.124) describing the **relationship** (B.395) of a **coordinate system** (B.90) to a local reference

NOTE Engineering datum excludes both **geodetic** (B.202) and **vertical datums** (B.525).

EXAMPLE A system for identifying **relative positions** (B.396) within a few kilometres of the reference point.

[ISO 19111:2007]

B.166
engineering viewpoint
viewpoint (B.526) on an ODP system and its environment that focuses on the mechanisms and **functions** (B.194) required to support distributed interaction between **objects** (B.326) in the system

[ISO 19119:2005]

B.167
enterprise viewpoint
viewpoint (B.526) on an ODP system and its environment that focuses on the purpose, scope and policies for that system

[ISO 19119:2005]

B.168
error
discrepancy with the **universe of discourse** (B.511)

[ISO/TS 19138:2006]

B.169
evaluation
〈coverage〉 determination of the **values** (B.515) of a **coverage** (B.97) at a **direct position** (B.138) within the **domain** (B.149) of the coverage

[ISO 19123:2005]

B.170
event
action which occurs at an **instant** (B.256)

[ISO 19108:2002]

B.171
executable test case
specific test of an **implementation** (B.244) to meet particular requirements

NOTE Instantiation of an **abstract test case** (B.2) with **values** (B.515).

[ISO 19105:2000]

B.172
ETS
executable test suite
set (B.433) of **executable test cases** (B.171)

[ISO 19105:2000]

B.173
extension
totality of **objects** (B.326) to which a **concept** (B.60) corresponds

[ISO 1087-1:2000]

B.174
exterior
difference between the universe and the **closure** (B.43)

NOTE The **concept** (B.60) of exterior is applicable to both **topological** (B.486) and **geometric complexes** (B.217).

[ISO 19107:2003]

B.175
external function
function (B.194) not part of the **application schema** (B.15)

NOTE The electronic **map** (B.297) in a car **navigation** (B.319) system has to be displayed so that the up-direction of the map is always in the direction in which the car is moving. To be able to specify the rotation of the map, the current **position** (B.365) of the car must be retrieved continuously from an external position device using an external function.

[ISO 19117:2005]

B.176
face
2-dimensional **topological primitive** (B.490)

NOTE The **geometric realization** (B.221) of a face is a **surface** (B.460). The **boundary** (B.27) of a face is the **set** (B.433) of **directed edges** (B.139) within the same **topological complex** (B.486) that are associated to the face via the boundary relations. These can be organized as **rings** (B.407).

[ISO 19107:2003]

B.177
fail verdict
test verdict of **non-conformance** (B.324)

NOTE Non-conformance may be with respect to either the test purpose or at least one of the **conformance** (B.67) requirements of the relevant standard(s).

[ISO 19105:2000]

B.178
falsification test
test to find **errors** (B.168) in the **implementation** (B.244)

NOTE If errors are found, one can correctly deduce that the implementation does not conform to the International Standard; however, the absence of errors does not necessarily imply the converse. The falsification test can only demonstrate **non-conformance** (B.324). Compare with the **verification test** (B.521). Due to technical and economic problems, in most cases, the falsification test is adopted as a test method for **conformance testing** (B.73).

[ISO 19105:2000]

B.179
feature
abstraction of real world phenomena

NOTE A feature may occur as a **type** (B.503) or an **instance** (B.253). Feature type or feature instance shall be used when only one is meant.

[ISO 19101:2002]

B.180
feature association
relationship (B.395) that links **instances** (B.253) of one **feature** (B.179) **type** (B.503) with instances of the same or a different feature type

[ISO 19110:2005]

B.181
feature attribute
characteristic of a **feature** (B.179)

EXAMPLE 1 A feature attribute named “colour” may have an **attribute** (B.18) **value** (B.515) “green” which belongs to the **data type** (B.121) “text”.

EXAMPLE 2 A feature attribute named “length” may have an attribute value “82.4” which belongs to the data type “real”.

NOTE 1 A feature attribute has a name, a data type and a **value domain** (B.516) associated to it. A feature attribute for a feature **instance** (B.253) also has an attribute value taken from the value domain.

NOTE 2 In a **feature catalogue** (B.182), a feature attribute may include a value domain but does not specify attribute values for feature instances.

[ISO 19101:2002]

B.182
feature catalogue
catalogue containing **definitions** (B.126) and descriptions of the **feature** (B.179) **types** (B.503), **feature attributes** (B.181), and **feature associations** (B.180) occurring in one or more **sets** (B.433) of **geographic data** (B.206), together with any **feature operations** (B.185) that may be applied

[ISO 19110:2005]

B.183
feature division
feature succession (B.188) in which a previously existing **feature** (B.179) is replaced by two or more distinct feature **instances** (B.253) of the same feature **type** (B.503)

EXAMPLE An instance of the feature type “land parcel” is replaced by two instances of the same type when the parcel is legally subdivided.

[ISO 19108:2002]

B.184
feature fusion
feature succession (B.188) in which two or more previously existing **instances** (B.253) of a **feature** (B.179) **type** (B.503) are replaced by a single instance of the same feature type

EXAMPLE Two instances of the feature type “pasture” are replaced by a single instance when the fence between the pastures is removed.

[ISO 19108:2002]

B.185
feature operation
operation (B.332) that every **instance** (B.253) of a **feature** (B.179) **type** (B.503) may perform

EXAMPLE A feature operation upon a “dam” is to raise the dam. The results of this operation are to raise the **height** (B.236) of the “dam” and the level of water in a “reservoir”.

NOTE Sometimes feature operations provide a basis for feature type **definition** (B.126).

[ISO 19110:2005]

B.186
feature portrayal rule set
collection of **portrayal rules** (B.362) that apply to a **feature** (B.179) **instance** (B.253)

[ISO 19117:2005]

B.187
feature substitution
feature succession (B.188) in which one **feature** (B.179) **instance** (B.253) is replaced by another feature instance of the same or different feature **type** (B.503)

EXAMPLE An instance of feature type “building” is razed and replaced by an instance of feature type “parking lot.”

[ISO 19108:2002]

B.188
feature succession
replacement of one or more **feature** (B.179) **instances** (B.253) by other feature instances such that the first feature instances cease to exist

[ISO 19108:2002]

B.189
feature table
table where the columns represent **feature attributes** (B.181), and the rows represent **features** (B.179)

[ISO 19125-2:2004]

B.190
file
named **set** (B.433) of **records** (B.385) stored or processed as a **unit** (B.507)

[ISO/IEC 2382-1:1993]

B.191
flattening
f

ratio of the difference between the semi-major (a) and **semi-minor axis** (B.422) (b) of an **ellipsoid** (B.154) to the **semi-major axis** (B.421): $f = (a - b)/a$

NOTE Sometimes inverse flattening $1/f = a/(a - b)$ is given instead; $1/f$ is also known as reciprocal flattening.

[ISO 19111:2007]

B.192
foliation
one parameter set of geometries (B.329) such that each **point** (B.352) in the **prism** (B.372) of the **set** (B.433) is in one and only one **trajectory** (B.494) and in one and only one **leaf** (B.278)

[ISO 19141:2008]

B.193
full inspection
inspection of every **item** (B.269) in a **dataset** (B.122)

NOTE Full inspection is also known as 100 % inspection.

[ISO 19114:2003]

B.194
function
rule that associates each **element** (B.153) from a **domain** (B.149) (source, or domain of the function) to a unique element in another domain [**target** (B.465), co-domain, or **range** (B.381)]

[ISO 19107:2003]

B.195
functional language
language (B.275) in which **feature operations** (B.185) are formally specified

NOTE In a functional language, **feature** (B.179) **types** (B.503) may be represented as abstract **data types** (B.121).

[ISO 19110:2005]

B.196
functional standard
existing **geographic information** (B.211) standard, in active use by an international community of **data** (B.103) producers and data **users** (B.512)

NOTE GDF, S-57, and DIGEST are examples of functional standards.

[ISO 19101:2002]

B.197
gazetteer
directory of **instances** (B.253) of a **class** (B.40) or classes of **features** (B.179) containing some **information** (B.250) regarding **position** (B.365)

NOTE The positional information need not be **coordinates** (B.84), but could be descriptive.

[ISO 19112:2003]

B.198
generalization
〈UML〉 taxonomic **relationship** (B.395) between a more general **element** (B.153) and a more specific element that is fully consistent with the more general element and contains additional **information** (B.250)

NOTE 1 An **instance** (B.254) of the more specific element may be used where the more general element is allowed.

NOTE 2 See **inheritance** (B.252).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.199
geocoding
translation of one form of **location** (B.291) into another

NOTE Geocoding usually refers to the translation of “address” or “intersection” to “**direct position** (B.138)”. Many **service** (B.427) providers also include a “reverse geocoding” **interface** (B.260) to their geocoder, thus extending the **definition** (B.126) of the **service** (B.427) to that of general translator of location. Because **routing** (B.412) services use internal location **encodings** (B.159) not usually available to others, a geocoder is an integral part of the internals of such a service.

[ISO 19133:2005]

B.200
geodetic coordinate reference system
coordinate reference system (B.88) based on a **geodetic datum** (B.202)

[ISO 19111:2007]

B.201
geodetic coordinate system
ellipsoidal coordinate system
coordinate system (B.90) in which **position** (B.365) is specified by **geodetic latitude** (B.204), **geodetic longitude** (B.205) and (in the three-dimensional case) **ellipsoidal height** (B.156)

[ISO 19111:2007]

B.202
geodetic datum
datum (B.124) describing the **relationship** (B.395) of a two- or three-dimensional **coordinate system** (B.90) to the Earth

[ISO 19111:2007]

B.203
geodetic height
ellipsoidal height
h
distance of a **point** (B.352) from the **ellipsoid** (B.154), measured along the perpendicular from the ellipsoid to this point, positive if upwards or outside of the ellipsoid

NOTE Only used as part of a three-dimensional **ellipsoidal coordinate system** (B.155) and never on its own.

[ISO 19111:2007]

B.204
geodetic latitude
ellipsoidal latitude
φ
angle from the equatorial plane to the perpendicular to the **ellipsoid** (B.154) through a given **point** (B.352), northwards treated as positive

[ISO 19111:2007]

B.205
geodetic longitude
ellipsoidal longitude
λ
angle from the **prime meridian** (B.370) plane to the **meridian** (B.305) plane of a given **point** (B.352), eastward treated as positive

[ISO 19111:2007]

B.206
geographic data
data (B.103) with implicit or explicit reference to a **location** (B.291) relative to the Earth

NOTE **Geographic information** (B.211) is also used as a **term** (B.475) for **information** (B.250) concerning phenomena implicitly or explicitly associated with a location relative to the Earth.

[ISO 19109:2005]

B.207
geographic feature
representation of real world phenomenon associated with a **location** (B.291) relative to the Earth

[ISO 19125-2:2004]

B.208
geographic identifier
spatial reference (B.444) in the form of a label or **code** (B.46) that identifies a **location** (B.291)

EXAMPLE "Spain" is an example of a country name, "SW1P 3AD" is an example of a postcode.

[ISO 19112:2003]

B.209
geographic imagery
imagery (B.243) associated with a **location** (B.291) relative to the Earth

[ISO/TS 19101-2:2008]

B.210
geographic imagery scene
geographic **imagery** (B.243) whose **data** (B.103) consists of **measurements** (B.301) or simulated measurements of the natural world produced relative to a specified vantage **point** (B.352) and at a specified time

[Derived from ISO 22028-1]

B.211
geographic information
information (B.250) concerning phenomena implicitly or explicitly associated with a **location** (B.291) relative to the Earth

[ISO 19101:2002]

B.212
geographic information service
service (B.427) that transforms, manages, or presents **geographic information** (B.211) to **users** (B.512)

[ISO 19101:2002]

B.213
geographic information system
information system dealing with **information** (B.250) concerning phenomena associated with **location** (B.291) relative to the Earth

[ISO 19101:2002]

B.214
geoid
equipotential **surface** (B.460) of the Earth's gravity field which is everywhere perpendicular to the direction of gravity and which best fits **mean sea level** (B.299), either locally or globally

[ISO 19111:2007]

B.215
geometric aggregate
collection of **geometric object** (B.219) that has no internal structure

NOTE No assumptions about the spatial **relationships** (B.395) between the **elements** (B.153) can be made.

[ISO 19107:2003]

B.216
geometric boundary
boundary (B.27) represented by a **set** (B.433) of **geometric primitives** (B.220) of smaller **geometric dimension** (B.218) that limits the extent of a **geometric object** (B.219)

[ISO 19107:2003]

B.217
geometric complex
set (B.433) of disjoint **geometric primitives** (B.220) where the **boundary** (B.27) of each geometric primitive can be represented as the union of other geometric primitives of smaller dimension within the same set

NOTE The geometric primitives in the set are disjoint in the sense that no **direct position** (B.138) is **interior** (B.262) to more than one geometric primitive. The set is closed under boundary **operations** (B.332), meaning that for each **element** (B.153) in the geometric complex, there is a collection (also a geometric complex) of geometric primitives that represents the boundary of that element. Recall that the boundary of a **point** (B.352) [the only 0D primitive **object** (B.326) **type** (B.503) in geometry] is empty. Thus, if the largest dimension geometric primitive is a **solid** (B.438) (3D), the **composition** (B.54) of the boundary operator in this **definition** (B.126) terminates after at most three steps. It is also the case that the boundary of any object is a **cycle** (B.101).

[ISO 19107:2003]

B.218
geometric dimension
largest number n such that each **direct position** (B.138) in a **geometric set** (B.222) can be associated with a subset that has the direct position in its **interior** (B.262) and is similar (isomorphic) to R^n, Euclidean n-space

NOTE **Curves** (B.99), because they are continuous images of a portion of the real line, have a geometric dimension 1. **Surfaces** (B.460) cannot be mapped to R^2 in their entirety, but around each **point** (B.352) **position** (B.365), a small **neighbourhood** (B.321) can be found that resembles, under continuous **functions** (B.194), the interior of the **unit** (B.507) circle in R^2, and are therefore 2-dimensional. In this International Standard, most **surface patches** (B.461) [**instances** (B.253) of GM_SurfacePatch] are mapped to portions of R^2 by their defining interpolation mechanisms.

[ISO 19107:2003]

B.219
geometric object
spatial object (B.442) representing a **geometric set** (B.222)

NOTE A geometric object consists of a **geometric primitive** (B.220), a collection of geometric primitives, or a **geometric complex** (B.217) treated as a single entity. A geometric object may be the spatial representation of an **object** (B.326) such as a **feature** (B.179) or a significant part of a feature.

[ISO 19107:2003]

B.220
geometric primitive
geometric object (B.219) representing a single, **connected** (B.74), homogeneous **element** (B.153) of space

NOTE Geometric primitives are non-decomposed **objects** (B.326) that present **information** (B.250) about geometric configuration. They include **points** (B.352), **curves** (B.99), **surfaces** (B.460), and **solids** (B.438).

[ISO 19107:2003]

B.221
geometric realization
geometric complex (B.217) whose **geometric primitives** (B.220) are in a one-to-one correspondence to the **topological primitives** (B.490) of a **topological complex** (B.486), such that the **boundary** (B.27) relations in the two complexes agree

NOTE In such a **realization** (B.384), the topological primitives are considered to represent the **interiors** (B.262) of the corresponding geometric primitives. Composites are closed.

[ISO 19107:2003]

B.222
geometric set
set (B.433) of **direct positions** (B.138)

NOTE This set, in most cases, is infinite.

[ISO 19107:2003]

B.223
geometry property
〈GML〉 **property** (B.376) of a GML **feature** (B.179) that describes some aspect of the geometry of the feature

NOTE The geometry property name is the role of the geometry in relation to the feature.

[ISO 19136:2007]

B.224
geometry value object
object (B.326) composed of a **set** (B.433) of **geometry value pairs** (B.225)

[ISO 19123:2005]

B.225
geometry value pair
ordered pair composed of a **spatial object** (B.442), a temporal **object** (B.326) or a **spatiotemporal object** (B.447) and a **record** (B.385) of **feature attribute** (B.181) **values** (B.515)

[ISO 19123:2005]

B.226
GML application schema
application schema (B.15) written in XML **Schema** (B.415) in accordance with the rules specified in this International Standard

[ISO 19136:2007]

B.227
GML document
XML document with a root **element** (B.153) that is one of the elements AbstractFeature, Dictionary or TopoComplex specified in the **GML schema** (B.229) or any element of a substitution group of any of these elements

[ISO 19136:2007]

B.228
GML profile
subset of the **GML schema** (B.229)

[ISO 19136:2007]

B.229
GML schema
schema (B.415) **components** (B.50) in the XML **namespace** (B.318) http://www.opengis.net/gml as specified in this International Standard

[ISO 19136:2007]

B.230
graph
set (B.433) of **nodes** (B.323), some of which are joined by **edges** (B.151)

NOTE In **geographic information systems** (B.213), a graph can have more than one edge joining two nodes, and can have an edge that has the same node at both ends.

[ISO 19107:2003]

B.231
graphical language
language (B.275) whose syntax is expressed in **terms** (B.475) of graphical symbols

[ISO 19101:2002]

B.232
gravity-related height
H
height (B.236) dependent on the Earth's gravity field

NOTE This refers in particular to orthometric height or normal height, which are both approximations of the distance of a **point** (B.352) above the **mean sea level** (B.299).

[ISO 19111:2007]

B.233
Gregorian calendar
calendar (B.29) in general use; first introduced in 1582 to define a year that more closely approximated the tropical year than the Julian calendar

NOTE The introduction of the Gregorian calendar included the cancellation of the accumulated inaccuracies of the Julian year. In the Gregorian calendar, a calendar year is either a common year or a leap year; each year is divided into 12 sequential **months** (B.315).

[ISO 19108:2002 – adapted from ISO 8601:2000]

B.234
grid
network (B.322) composed of two or more **sets** (B.433) of **curves** (B.99) in which the members of each set intersect the members of the other sets in an algorithmic way

NOTE The curves partition a space into grid cells.

[ISO 19123:2005]

B.235
grid point
point (B.352) located at the intersection of two or more **curves** (B.99) in a **grid** (B.234)

[ISO 19123:2005]

B.236
height
h, H
distance of a **point** (B.352) from a chosen reference **surface** (B.460), measured upward along a line perpendicular to that surface

NOTE A height below the reference surface will have a negative **value** (B.515).

[ISO 19111:2007]

B.237
hierarchical register
structured **set** (B.433) of **registers** (B.390) for a **domain** (B.149) of register **items** (B.269), composed of a **principal register** (B.371) and a set of **subregisters** (B.458)

EXAMPLE ISO 6523 is associated with a hierarchical register. The principal register contains organization **identifier** (B.239) schemes and each subregister contains a set of organization identifiers that comply with a single organization identifier scheme.

[ISO 19135:2005]

B.238
homomorphism
relationship (B.395) between two **domains** (B.149) (such as two complexes) such that there is a structure preserving **function** (B.194) from one to the other

NOTE Homomorphisms are distinct from **isomorphisms** (B.268) in that no inverse function is required. In an isomorphism, there are essentially two homomorphisms that are functional inverses of one another. Continuous functions are topological homomorphisms because they preserve "topological characteristics." The mapping of **topological complexes** (B.486) to their **geometric realizations** (B.221) preserves the **concept** (B.60) of **boundary** (B.27) and is therefore a homomorphism.

[ISO 19107:2003]

B.239
identifier
linguistically independent **sequence** (B.425) of **characters** (B.36) capable of uniquely and permanently identifying that with which it is associated

[ISO 19135:2005 – adapted from ISO/IEC 11179-3:2003]

B.240
identity
data (B.103) sufficient to identify an **object** (B.326) over time, independent of its **state** (B.452)

NOTE An identity is usually a persistent and constant key member **attribute** (B.18) **value** (B.515) of the object. Since it is temporally constant and unique, it will be the same in any state associated to the object regardless of its **timestamp** (B.484). A moving object's identity is independent of both time and **location** (B.291).

[ISO 19132:2007]

B.241
image coordinate reference system
coordinate reference system (B.88) based on an **image datum** (B.242)

[ISO 19111:2007]

B.242
image datum
engineering datum (B.165) which defines the **relationship** (B.395) of a **coordinate system** (B.90) to an image

[ISO 19111:2007]

B.243
imagery
representation of phenomena as images produced by electronic and/or optical techniques

NOTE In this Technical Specification, it is assumed that the phenomena have been sensed or detected by one or more devices such as radar, cameras, photometers, and infrared and multispectral scanners.

[ISO/TS 19101-2:2008]

B.244
implementation
realization (B.384) of a **specification** (B.448)

NOTE In the context of the ISO **geographic information** (B.211) standards, this includes specifications of **geographic information services** (B.212) and **datasets** (B.122).

[ISO 19105:2000]

B.245
ICS
Implementation Conformance Statement
statement of **specification** (B.448) options that have been implemented

[ISO 19105:2000]

B.246
IXIT
Implementation eXtra Information for Testing
statement containing all of the **information** (B.250) related to the IUT and its corresponding SUT which will enable the **testing laboratory** (B.482) to run an appropriate test suite against that IUT

NOTE IXIT typically provides the details on the organization and storage of **concepts** (B.60) in the SUT as well as on the means of access to, and modification of, the SUT.

[ISO 19105:2000]

B.247
inconclusive verdict
test verdict when neither a **pass verdict** (B.340) nor a **fail verdict** (B.177) apply

[ISO 19105:2000]

B.248
indirect evaluation method
method (B.312) of evaluating the **quality** (B.377) of a **dataset** (B.122) based on external knowledge

NOTE Examples of external knowledge are dataset lineage, such as production method or source **data** (B.103).

[ISO 19114:2003]

B.249
inertial positioning system
positioning system (B.367) employing accelerometers, gyroscopes, and computer as integral **components** (B.50) to determine **coordinates** (B.84) of **points** (B.352) or **objects** (B.326) relative to an initial known reference point

[ISO 19116:2004]

B.250
information
knowledge concerning **objects** (B.326), such as facts, **events** (B.170), things, processes, or ideas, including **concepts** (B.60), that within a certain context has a particular meaning

[ISO/IEC 2382-1:1993]

B.251
information viewpoint
viewpoint (B.526) on an ODP system and its environment that focuses on the semantics of **information** (B.250) and information processing

[ISO/IEC 10746-2]

B.252
inheritance
〈UML〉 mechanism by which more specific **elements** (B.153) incorporate structure and **behaviour** (B.26) of more general elements related by behaviour

NOTE See **generalization** (B.198).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.253
instance
object (B.326) that realizes a **class** (B.40)

[ISO 19107:2003]

B.254
instance
〈UML〉 entity that has unique **identity** (B.240), a **set** (B.433) of **operations** (B.333) can be applied to it, and state that stores the effects of the operations

NOTE See: **object** (B.326).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.255
instance model
representation **model** (B.314) for storing **data** (B.103) according to an **application schema** (B.15)

[ISO 19118:2005]

B.256
instant
0-dimensional **geometric primitive** (B.220) representing **position** (B.365) in time

NOTE The geometry of time is discussed in 5.2 of ISO 19108:2002.

[ISO 19108:2002]

B.257
instantiate
to represent (an abstraction) by the creation of a concrete **instance** (B.253) or to create the ability to create an instance

NOTE A **class** (B.40) or **data element** (B.104) **definition** (B.126) instantiates a **type** (B.503) if it creates the ability to create **objects** (B.326) or data elements, respectively, that can represent the **concepts** (B.60) [instance **data** (B.103) and/or **operations** (B.332)] defined by that type. A class is instantiated by an object if the class defines that object's structure and **function** (B.194). A data **schema** (B.414) is instantiated by a data element if the data schema defines that **element's** (B.153) structure.

[ISO 19133:2005]

B.258
integrated positioning system
positioning system (B.367) incorporating two or more positioning technologies

NOTE The **measurements** (B.301) produced by each positioning technology in an integrated system may be any of **position** (B.365), **motion** (B.316), or **attitude** (B.17). There may be redundant measurements. When combined, a unified position, motion, or attitude is determined.

[ISO 19116:2004]

B.259
integration
linkage of two or more software systems by the use of a common **data** (B.103) and **method** (B.312) base

NOTE 1 See **coupling** (B.96).

NOTE 2 Integration and coupling are the two major mechanisms for the interoperation of systems.

[ISO 19132:2007]

B.260
interface
named **set** (B.433) of **operations** (B.332) that characterize the **behaviour** (B.26) of an entity

NOTE See 7.2 of ISO 19119 for a discussion of “interface”.

[ISO 19119:2005]

B.261
interface
〈UML〉 named **set** (B.433) of **operations** (B.332) that characterizes the **behaviour** (B.26) of an **element** (B.153)

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.262
interior
set (B.433) of all **direct positions** (B.138) that are on a **geometric object** (B.219), but which are not on its **boundary** (B.27)

NOTE The interior of a **topological object** (B.489) is the homomorphic image of the interior of any of its **geometric realizations** (B.221). This is not included as a **definition** (B.126) because it follows from a theorem of topology.

[ISO 19107:2003]

B.263
interoperability
capability to communicate, execute programs, or transfer **data** (B.103) among various functional **units** (B.507) in a manner that requires the **user** (B.512) to have little or no knowledge of the unique characteristics of those units

[ISO/IEC 2382-1:1993]

B.264
interoperate
communicate, execute programs, or transfer **data** (B.103) among various functional **units** (B.507) in a manner that requires the **user** (B.512) to have little or no knowledge of the unique characteristics of those units

NOTE See **interoperability** (B.263).

[ISO 19132:2007]

B.265
interval scale
scale with an arbitrary origin which can be used to describe both ordering of **values** (B.515) and distances between values

NOTE Ratios of values measured on an interval scale have no meaning.

[ISO 19108:2002]

B.266
inverse evaluation
⟨coverage⟩ selection of a **set** (B.433) of **objects** (B.326) from the **domain** (B.149) of a **coverage** (B.97) based on the **feature attribute** (B.181) **values** (B.515) associated with the objects

[ISO 19123:2005]

B.267
isolated node
node (B.323) not related to any **edge** (B.151)

[ISO 19107:2003]

B.268
isomorphism
relationship (B.395) between two **domains** (B.149) (such as two complexes) such that there are one-to-one, structure-preserving **functions** (B.194) from each domain onto the other, and the **composition** (B.54) of the two functions, in either order, is the corresponding **identity** (B.240) function

NOTE A **geometric complex** (B.217) is isomorphic to a **topological complex** (B.486) if their **elements** (B.153) are in a one-to-one, dimension- and boundary-preserving correspondence to one another.

[ISO 19107:2003]

B.269
item
that which can be individually described or considered

NOTE An item can be any part of a **dataset** (B.122), such as a **feature** (B.179), feature **relationship** (B.395), **feature attribute** (B.181), or combination of these.

[ISO 2859-1:1999]

B.270
item class
set (B.433) of **items** (B.269) with common properties

NOTE **Class** (B.40) is used in this context to refer to a set of **instances** (B.253), not the **concept** (B.60) abstracted from that set of instances.

[ISO 19135:2005]

B.271
Julian date
Julian day number (B.272) followed by the decimal fraction of the **day** (B.125) elapsed since the preceding noon

[ISO 19108:2002]

B.272
Julian day number
number of **days** (B.125) elapsed since Greenwich mean noon on 1 January 4713 BC, Julian proleptic **calendar** (B.29)

[ISO 19108:2002]

B.273
junction
single topological **node** (B.323) in a **network** (B.322) with its associated collection of **turns** (B.502), incoming and outgoing **links** (B.287)

NOTE Junction is an alias for node.

[ISO 19133:2005]

B.274
knowledge base
database (B.103) of knowledge about a particular subject

NOTE The database contains facts, inferences, and procedures needed for problem solution [Webster Computer].

[ISO/TS 19101-2:2008]

B.275
language
system of signs for communications, usually consisting of vocabulary and rules

NOTE In this context, language refers to natural language or special languages but not programming languages or artificial languages, unless specifically identified.

[ISO 5127-1]

B.276
language identifier
information (B.250) in a terminological entry which indicates the name of a **language** (B.275)

[ISO 1087-1:2000]

B.277
layer
basic **unit** (B.507) of **geographic information** (B.211) that may be requested as a **map** (B.297) from a **server** (B.426)

[ISO 19128:2005]

B.278
leaf
⟨one-parameter set of geometries⟩ geometry at a particular **value** (B.515) of the parameter

[ISO 19141:2008]

B.279
lexical language
language (B.275) whose syntax is expressed in terms of symbols defined as **character** (B.36) strings

[ISO 19101:2002]

B.280
license
permission or proof of permission granted to a system participant by a competent authority to exercise a **right** (B.405) which would otherwise be disallowed or unlawful

[ISO 19132:2007]

B.281
life span
period (B.345) during which something exists

NOTE Valid-time life span is the period during which an **object** (B.326) exists in the modelled reality. Transaction-time life span is the period during which a database object is current in the database.

[ISO 19108:2002]

B.282
line string
curve (B.99) composed of straight-line **segments** (B.419)

[ISO 19136:2007]

B.283
linear coordinate system
one-dimensional **coordinate system** (B.90) in which a linear **feature** (B.179) forms the axis

EXAMPLE Distances along a pipeline; **depths** (B.130) down a deviated oil well bore.

[ISO 19111:2007]

B.284
linear positioning system
positioning system (B.367) that measures distance from a reference **point** (B.352) along a **route** (B.409)

NOTE An odometer used in conjunction with predefined mile or kilometre origin points along a route provides a linear reference to a **position** (B.365).

[ISO 19116:2004]

B.285
linear reference system
reference system that identifies a **location** (B.291) by reference to a **segment** (B.419) of a linear **geographic feature** (B.207) and the distance along that segment from a given **point** (B.352)

NOTE Linear reference systems are widely used in transportation, for example highway names and mile or kilometre markers.

[ISO 19116:2004]

B.286
linear referencing system
positioning system (B.367) that measures distance from a reference **point** (B.352) along a **route** (B.409) [**feature** (B.179)]

NOTE The system includes the complete **set** (B.433) of procedures for determining and retaining a **record** (B.385) of specific points along a linear feature, such as the **location** (B.291) reference **method(s)** (B.312), together with the procedures for storing, maintaining, and retrieving location **information** (B.250) about points and **segments** (B.419) on the highways [NCHRP Synthesis 21, 1974].

[ISO 19133:2005]

B.287
link
directed topological connection between two **nodes** (B.323) [**junctions** (B.273)], consisting of an **edge** (B.151) and a direction

NOTE Link is an alias for **directed edge** (B.139).

[ISO 19133:2005]

B.288
link position
position (B.365) within a **network** (B.322) on a **link** (B.287) defined by some strictly monotonic **measure** (B.303) associated with that link

NOTE Link positions are often associated with a **targets** (B.465) **feature** (B.179) that is not part of the network. The most common link measures used for this are the distance from **start node** (B.450) or address. The most common use of a link position is to geolocate an "address".

[ISO 19133:2005]

B.289
local datum
engineering datum
datum (B.124) describing the **relationship** (B.395) of a **coordinate system** (B.90) to a local reference

EXAMPLE A system for identifying **relative positions** (B.396) within a few kilometres of the reference **point** (B.352).

NOTE **Engineering datum** (B.165) excludes both **geodetic** (B.202) and **vertical datums** (B.525).

[ISO 19111:2007]

B.290
locale
cultural and linguistic setting applicable to the interpretation of a **character** (B.36) string

[ISO 19135:2005]

B.291
location
identifiable geographic place

EXAMPLE "Eiffel Tower", "Madrid", "California".

[ISO 19112:2003]

B.292
location-based service
LBS
service (B.427) whose return or other property is dependent on the **location** (B.291) of the **client** (B.42) requesting the service or of some other thing, **object** (B.326) or person

[ISO 19133:2005]

B.293
location-dependent service
LDS
service (B.427) whose availability is dependent on the **location** (B.291) of the **client** (B.42)

[ISO 19133:2005]

B.294
loosely coupled interface
message-based **service interface** (B.431) based on a common taxonomic **definition** (B.126) and independent of the particulars of message format or representation and of the internal **implementation** (B.244) of the **service** (B.427)

NOTE See **coupling** (B.96).

[ISO 19132:2007]

B.295
main-road rule
set (B.433) of criteria used at a **turn** (B.502) in lieu of a **route** (B.409) instruction; default instruction used at a **node** (B.323)

NOTE This rule represents what is “most natural” to do at a node (intersection), given the entry **link** (B.287) used. The most common **version** (B.522) is “as straight as possible”, or to exit a turn on the most obvious extension of the entry street, which is usually, but not always, the same named street that was the entry. Every node in a route is either associated with an instruction or can be navigated by the main-road rule.

[ISO 19133:2005]

B.296
maneuver
manœuvre
collection of related **links** (B.287) and **turns** (B.502) used in a **route** (B.409) in combination

NOTE Maneuvers are used to cluster turns into convenient and legal combinations. They may be as simple as a single turn, a combination of quick turns (“jogs” in the American Midwest consisting of a turn followed immediately by a turn in the opposite direction) or very complex combinations consisting of entry, exit, and connecting roadways (“magic roundabouts” in the UK).

[ISO 19133:2005]

B.297
map
portrayal (B.360) of **geographic information** (B.211) as a digital image **file** (B.190) suitable for display on a computer screen

[ISO 19128:2005]

B.298
map projection
coordinate conversion (B.85) from an **ellipsoidal coordinate system** (B.155) to a plane

[ISO 19111:2007]

B.299
mean sea level
average level of the **surface** (B.460) of the sea over all stages of tide and seasonal variations

NOTE Mean sea level in a local context normally means mean sea level for the region, calculated from observations at one or more **points** (B.352) over a given **period** (B.345) of time. Mean sea level in a global context differs from a global **geoid** (B.214) by not more than 2 m.

[ISO 19111:2007]

B.300
measureable quantity
attribute of a phenomenon, body or substance that may be distinguished qualitatively and determined quantitatively

[International Vocabulary of Basic and General Terms in Metrology (VIM)]

B.301
measurement
set (B.433) of **operations** (B.332) having the **object** (B.326) of determining the **value** (B.515) of a quantity

[International Vocabulary of Basic and General Terms in Metrology (VIM)]

B.302
measurand
particular quantity subject to **measurement** (B.301)

[International Vocabulary of Basic and General Terms in Metrology (VIM)]

B.303
measure
〈GML〉 **value** (B.515) described using a numeric amount with a scale or using a scalar reference system

NOTE When used as a noun, measure is a synonym for **physical quantity** (B.347).

[ISO 19136:2007]

B.304
medium
substance or agency for storing or transmitting **data** (B.103)

EXAMPLE Compact disc, internet, radio waves, etc.

[ISO 19118:2005]

B.305
meridian
intersection of an **ellipsoid** (B.154) by a plane containing the shortest axis of the ellipsoid

NOTE This **term** (B.475) is often used for the pole-to-pole arc rather than the complete closed figure.

[ISO 19111:2007]

B.306
metadata
data (B.103) about data

[ISO 19115:2003]

B.307
metadata element
discrete **unit** (B.507) of **metadata** (B.306)

NOTE 1 Metadata **elements** (B.153) are unique within a **metadata entity** (B.308).

NOTE 2 Equivalent to an **attribute** (B.18) in UML terminology.

[ISO 19115:2003]

B.308
metadata entity
set (B.433) of **metadata elements** (B.307) describing the same aspect of **data** (B.103)

NOTE 1 May contain one or more **metadata** (B.306) entities.

NOTE 2 Equivalent to a **class** (B.40) in UML terminology.

[ISO 19115:2003]

B.309
metadata schema
conceptual schema (B.65) describing **metadata** (B.306)

NOTE ISO 19115 establishes a standard for a **metadata schema** (B.309).

[ISO 19101:2002]

B.310
metadata section
subset of **metadata** (B.306) which consists of a collection of related **metadata entities** (B.308) and **metadata elements** (B.307)

NOTE Equivalent to a **package** (B.339) in UML terminology.

[ISO 19115:2003]

B.311
metamodel
〈UML〉 **model** (B.314) that defines the **language** (B.275) for expressing a model

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.312
method
〈UML〉 **implementation** (B.244) of an **operation** (B.333)

NOTE It specifies the algorithm or procedure associated with an operation.

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.313
metric traceability
property of the result of a **measurement** (B.301) or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties

NOTE Adapted from the International Vocabulary of Basic and General Terms in Metrology (VIM).

B.314
model
abstraction of some aspects of reality

[ISO 19109:2005]

B.315
month
period (B.345) approximately equal in duration to the **periodic time** (B.346) of a lunar **cycle** (B.101)

NOTE The duration of a month is an integer number of **days** (B.125). The number of days in a month is determined by the rules of the particular **calendar** (B.29).

[ISO 19108:2002]

B.316
motion
change in the **position** (B.365) of an **object** (B.326) over time, represented by a change of **coordinate** (B.84) **values** (B.515) with respect to a particular reference frame

EXAMPLE This may be motion of the position **sensor** (B.423) mounted on a **vehicle** (B.519) or other platform, or motion of an object being tracked by a **positioning system** (B.367).

[ISO 19116:2004]

B.317
multiplicity
〈UML〉 **specification** (B.448) of the **range** (B.382) of allowable cardinalities that a **set** (B.433) may assume

NOTE 1 Multiplicity specifications may be given for roles within **associations** (B.16), parts within composites, repetitions and other purposes. Essentially, a multiplicity is a (possibly infinite) subset of the non-negative integers.

NOTE 2 Contrast: **cardinality** (B.34).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.318
namespace
collection of names, identified by a URI reference, that are used in XML documents as **element** (B.153) names and **attribute** (B.19) names

[W3C XML]

B.319
navigation
combination of **routing** (B.412), **route traversal** (B.411) and **tracking** (B.492)

NOTE This is essentially the common **term** (B.475) “navigation”, but the **definition** (B.126) decomposes the process in terms used in the **packages** (B.339) defined in this International Standard.

[ISO 19133:2005]

B.320
navigation constraint
restriction on how a **link** (B.287) or **turn** (B.502) may be traversed by a **vehicle** (B.519), such as **vehicle classification** (B.520), physical or temporal **constraint** (B.76)

[ISO 19133:2005]

B.321
neighbourhood
geometric set (B.222) containing a specified **direct position** (B.138) in its **interior** (B.262), and containing all direct positions within a specified distance of the specified direct position

[ISO 19107:2003]

B.322
network
abstract structure consisting of a **set** (B.433) of 0-dimensional **objects** (B.326) called **junctions** (B.273), and a set of 1-dimensional objects called **links** (B.287) that connect the junctions, each link being associated with a start (origin, source) junction and an end (destination, sink) junction

NOTE The network is essentially the **universe of discourse** (B.511) for the **navigation** (B.319) problem. Networks are a variety of one-dimensional **topological complexes** (B.486). In this light, junction and topological **node** (B.323) are synonyms, as are link and **directed edge** (B.139).

[ISO 19133:2005]

B.323
node
0-dimensional **topological primitive** (B.490)

NOTE The **boundary** (B.27) of a node is the empty **set** (B.433).

[ISO 19107:2003]

B.324
non-conformance
failure to fulfil one or more specified requirements

[ISO 19105:2000]

B.325
northing
N
distance in a **coordinate system** (B.90), northwards (positive) or southwards (negative) from an east-west reference line

[ISO 19111:2007]

B.326
object
〈UML〉 entity with a well-defined **boundary** (B.27) and **identity** (B.240), which encapsulates **state** (B.452) and **behaviour** (B.26)

NOTE State is represented by **attributes** (B.18) and **relationships** (B.395), behaviour is represented by **operations** (B.333), **methods** (B.312), and state machines. An object is an **instance** (B.254) of a **class** (B.40).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.327
observable type
data type (B.121) to indicate the **physical quantity** (B.347) as a result of an observation

[ISO 19136:2007]

B.328
obsolete term
term (B.475) which is no longer in common use

[ISO 1087-1:2000]

B.329
one-parameter set of geometries
function (B.194) f from an interval $t \in [a, b]$ such that f(t) is a geometry and, for each **point** (B.352) $P \in f(a)$, there is a one-parameter **se**t (B.433) of points (called the **trajectory** (B.494) of P) $P(t): [a, b] \rightarrow P(t)$ such that $P(t) \in f(t)$

EXAMPLE A curve C with constructive parameter t is a one-parameter set of points c(t).

[ISO 19141:2008]

B.330
open systems environment
OSE
comprehensive **set** (B.433) of **interfaces** (B.260), **services** (B.427) and supporting formats, plus **user** (B.512) aspects, for **interoperability** (B.263) and/or portability of **applications** (B.14), **data** (B.103), or people, as specified by **information** (B.250) technology standards and **profiles** (B.374)

[ISO/IEC TR 10000-1:1998]

B.331
operating conditions
parameters influencing the determination of **coordinate** (B.84) **values** (B.515) by a **positioning system** (B.367)

NOTE Measurements acquired in the field are affected by many instrumental and environmental factors, including meteorological conditions, computational **methods** (B.312) and **constraints** (B.76), imperfect instrument construction, incomplete instrument adjustment or **calibration** (B.31), and, in the case of optical measuring systems, the personal bias of the observer. Solutions for **positions** (B.365) may be affected by the geometric **relationships** (B.395) of the observed **data** (B.103) and/or mathematical **model** (B.314) employed in the processing software.

[ISO 19116:2004]

B.332
operation
specification (B.448) of a transformation or query that an **object** (B.326) may be called to execute

NOTE 1 An operation has a name and a list of parameters.

NOTE 2 See 7.2 of ISO 19119 for a discussion of operation.

[ISO 19119:2005]

B.333
operation
〈UML〉 **service** (B.427) that can be requested from an **object** (B.326) to affect **behaviour** (B.26)

NOTE 1 An operation has a signature, which may restrict the actual parameters that are possible.

NOTE 2 Definition from UML Reference Manual: "**specification** (B.448) of a transformation or query that an object may be called to execute".

NOTE 3 An operation has a name and a list of parameters. A **method** (B.312) is a procedure that implements an operation. It has an algorithm or procedure description.

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.334
optical positioning system
positioning system (B.367) that determines the **position** (B.365) of an **object** (B.326) by means of the properties of light

EXAMPLE Total station: commonly used **term** (B.475) for an integrated optical positioning system incorporating an electronic theodolite and an electronic distance-measuring instrument into a single **unit** (B.507) with an internal microprocessor for automatic computations.

[ISO 19116:2004]

B.335
ordinal era
one of a **set** (B.433) of named **periods** (B.345) ordered in time

[ISO 19108:2002]

B.336
ordinal scale
scale that provides a basis for measuring only the **relative position** (B.396) of an **object** (B.326)

[ISO 19108:2002]

B.337
ordinal temporal reference system
temporal reference system (B.473) composed of **ordinal eras** (B.335)

[ISO 19108:2002]

B.338
orthoimage
image in which, by orthogonal projection to a reference **surface** (B.460), displacement of image **points** (B.352) due to **sensor** (B.423) orientation and terrain relief has been removed

NOTE The amount of displacement depends on the **resolution** (B.400) and the level of detail of the elevation **information** (B.250) and on the software **implementation** (B.244).

[ISO/TS 19101-2:2008]

B.339
package
〈UML〉 general purpose mechanism for organizing **elements** (B.153) into groups

NOTE Packages may be nested within other packages. Both **model** (B.314) elements and diagrams may appear in a package.

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.340
pass verdict
test verdict of **conformance** (B.67)

[ISO 19105:2000]

B.341
passive object
object (B.326) which can only react to external stimulation and cannot initiate actions on its own

NOTE A passive object is usually accessed through an external **interface** (B.260), through which it receives **requests** (B.399), processes those requests and returns **data** (B.103) as a **response** (B.403) to that request. Since objects can implement more than one **type** (B.503), it is possible for a single object to pass through active and passive **states** (B.452). For example, a **tracking** (B.492) **service** (B.427) can lie dormant until a tracking request activates a **period** (B.345) where the internals of the object initiate tracking activities based on internal triggers, as specified within the request. When the tracking request is deactivated, the object may return to a passive state.

[ISO 19132:2007]

B.342
passive tracking
tracking (B.492) dependent on stationary **sensors** (B.423) external to the **vehicle** (B.519) or **traveller** (B.498) allowing for **measurements** (B.301) of **location** (B.291) when the vehicle's or traveller's **tracking device** (B.493) passes through the **range** (B.381) of external sensors of known **position** (B.365)

[ISO 19132:2007]

B.343
performance indicator
internal parameters of **positioning systems** (B.367) indicative of the level of performance achieved

NOTE Performance indicators can be used as quality-control evidence of the positioning system and/or positioning solution. Internal **quality** (B.377) control may include such factors as signal strength of received radio signals [signal-to-noise ratio (SNR)], figures indicating the dilution of **precision** (B.368) (DOP) due to geometric **constraints** (B.76) in radiolocation systems, and system-specific figure of merit (FOM).

[ISO 19116:2004]

B.344
performance testing
measurement (B.301) of the performance characteristics of an **Implementation** (B.244) Under Test (IUT), such as its throughput, responsiveness, etc., under various conditions

NOTE This is not a part of **conformance testing** (B.73).

[ISO 19105:2000]

B.345
period
one-dimensional **geometric primitive** (B.220) representing extent in time

NOTE A period is bounded by two different **temporal positions** (B.472).

[ISO 19108:2002]

B.346
periodic time
duration of one **cycle** (B.101)

[ISO 19108:2002 – adapted from ISO 31-2:1992]

B.347
physical quantity
quantity used for the quantitative description of physical phenomena

NOTE In GML a physical quantity is always a **value** (B.515) described using a numeric amount with a scale or using a scalar reference system. Physical quantity is a synonym for **measure** (B.303) when the latter is used as a noun.

[ISO 31-0:1992]

B.348
picture original
representation of a two-dimensional hardcopy or softcopy input image in terms of the colour-space **coordinates** (B.84) (or an approximation thereof)

NOTE Picture originals could be obtained from printed **maps** (B.297), printed pictures of a **geographic imagery scene** (B.210), or drawings of **geographic information** (B.211), etc.

[ISO/TS 19101-2:2008]

B.349
picture portrayal
representations of image **data** (B.103) in terms of the colour-space **coordinates** (B.84) that are appropriate for, and tightly coupled to, the characteristics of a specified real or virtual output device and viewing

NOTE Picture **portrayals** (B.360) are geared for visual display whether in hardcopy or softcopy.

[ISO/TS 19101-2:2008]

B.350
pixel
smallest **element** (B.153) of a digital image to which attributes are assigned

NOTE 1 This term originated as a contraction of “picture element”.

NOTE 2 Related to the **concept** (B.60) of a **grid** (B.234) cell.

[ISO/TS 19101-2:2008]

B.351
planar topological complex
topological complex (B.486) that has a **geometric realization** (B.221) that can be embedded in Euclidean 2-space

[ISO 19107:2003]

B.352
point
0-dimensional **geometric primitive** (B.220), representing a **position** (B.365)

NOTE The **boundary** (B.27) of a point is the empty **set** (B.433).

[ISO 19107:2003]

B.353
point coverage
coverage (B.97) that has a **domain** (B.149) composed of **points** (B.352)

[ISO 19123:2005]

B.354
polar coordinate system
two-dimensional **coordinate system** (B.90) in which **position** (B.365) is specified by distance and direction from the origin

NOTE For the three-dimensional case, see **spherical coordinate system** (B.449).

[ISO 19111:2007]

B.355
policy
set (B.433) of rules related to a particular purpose

[ISO/IEC 10746-2]

B.356
polygon
planar **surface** (B.460) defined by 1 **exterior** (B.174) **boundary** (B.27) and 0 or more **interior** (B.262) boundaries

[ISO 19136:2007]

B.357
polygon coverage
coverage (B.97) that has a **domain** (B.149) composed of **polygons** (B.356)

[ISO 19123:2005]

B.358
polymorphism
characteristic of being able to assign a different meaning or usage to something in different contexts specifically, to allow an entity such as a variable, a **function** (B.194), or an **object** (B.326) to have more than one form

NOTE There are several different kinds of polymorphism.

[ISO/TS 19139:2007]

B.359
population
totality of **items** (B.269) under consideration

EXAMPLE 1 All **points** (B.352) in a **dataset** (B.122).

EXAMPLE 2 Names of all roads in a certain geographic area.

[ISO 3534-2:2006]

B.360
portrayal
presentation of **information** (B.250) to humans

[ISO 19117:2005]

B.361
portrayal catalogue
collection of all defined **portrayals** (B.360)

[ISO 19117:2005]

B.362
portrayal rule
rule that is applied to the **feature** (B.179) to determine what **portrayal specification** (B.364) to use

[ISO 19117:2005]

B.363
portrayal service
generic **interface** (B.260) used to portray a **feature** (B.179)

[ISO 19117:2005]

B.364
portrayal specification
collection of **operations** (B.332) applied to the **feature** (B.179) **instance** (B.253) to portray it

[ISO 19117:2005]

B.365
position
data type (B.121) that describes a **point** (B.352) or geometry potentially occupied by an **object** (B.326) or person

NOTE A **direct position** (B.138) is a semantic subtype of position. Direct positions as described can only define a point and therefore not all positions can be represented by a direct position. That is consistent with the "is **type** (B.503) of" relation. An ISO 19107 geometry is also a position, just not a direct position.

[ISO 19133:2005]

B.366
positional accuracy
closeness of **coordinate** (B.84) **value** (B.515) to the true or accepted value in a specified reference system

NOTE The phrase "absolute accuracy" is sometimes used for this **concept** (B.60) to distinguish it from **relative positional accuracy** (B.397). Where the true coordinate value may not be perfectly known, **accuracy** (B.7) is normally tested by comparison to available values that can best be accepted as true.

[ISO 19116:2004]

B.367
positioning system
system of instrumental and computational **components** (B.50) for determining **position** (B.365)

NOTE Examples include **inertial** (B.249), **integrated** (B.258), **linear** (B.284), optical, and **satellite positioning systems** (B.413).

[ISO 19116:2004]

B.368
precision
measure (B.303) of the repeatability of a **set** (B.433) of **measurements** (B.301)

NOTE Precision is usually expressed as a statistical **value** (B.515) based upon a set of repeated measurements such as the standard deviation from the sample mean.

[ISO 19116:2004]

B.369
preferred term
term (B.475) rated according to the scale of the term acceptability rating as the primary term for a given **concept** (B.60)

[ISO 1087-1:2000]

B.370
prime meridian
zero meridian
meridian (B.305) from which the longitudes of other meridians are quantified

[ISO 19111:2007]

B.371
principal register
register (B.390) that contains a description of each of the **subregisters** (B.458) in a **hierarchical register** (B.237)

[ISO 19135:2005]

B.372
prism
〈one-parameter set of geometries〉 **set** (B.433) of **points** (B.352) in the union of the geometries (or the union of the trajectories) of a **one-parameter set of geometries** (B.329)

NOTE This is a **generalization** (B.198) of the **concept** (B.60) of a geometric prism that is the **convex hull** (B.82) of two congruent **polygons** (B.356) in 3D space. Such polyhedrons can be viewed as a **foliation** (B.192) of congruent polygons.

[ISO 19141:2008]

B.373
product specification
description of the **universe of discourse** (B.511) and **specification** (B.448) for mapping the universe of discourse to a **dataset** (B.122)

[ISO 19113:2002]

B.374
profile
set (B.433) of one or more **base standards** (B.23) or subsets of base standards, and, where applicable, the identification of chosen clauses, **classes** (B.40), options and parameters of those base standards, that are necessary for accomplishing a particular **function** (B.194)

NOTE A profile is derived from base standards so that by **definition** (B.126), **conformance** (B.67) to a profile is conformance to the base standards from which it is derived.

[ISO 19106:2004 – adapted from ISO/IEC TR 10000-1:1998]

B.375
projected coordinate reference system
coordinate reference system (B.88) derived from a two-dimensional **geodetic coordinate reference system** (B.200) by applying a **map projection** (B.298)

[ISO 19111:2007]

B.376
property
〈GML〉 a **child element** (B.37) of a GML **object** (B.326)

NOTE It corresponds to the **feature attribute** (B.181) and **feature association** (B.180) role in ISO 19109. If a GML property of a **feature** (B.179) has an xlink:href **attribute** (B.19) that references a feature, the property represents a feature association role.

[ISO 19136:2007]

B.377
quality
totality of characteristics of a product that bear on its ability to satisfy stated and implied needs

[ISO 19101:2002]

B.378
quality schema
conceptual schema (B.65) defining aspects of **quality** (B.377) for **geographic data** (B.206)

[ISO 19101:2002]

B.379
radiance
at a **point** (B.352) on a **surface** (B.460) and in a given direction, radiant intensity of an **element** (B.153) of the surface, divided by the area of the orthogonal projection of this element on a plane perpendicular to the given direction

[ISO 31-6]

B.380
radiant energy
energy emitted, transferred or received as radiation

[ISO 31-6]

B.381
range
set (B.433) of all **values** (B.515) a **function** (B.194) f can take as its arguments vary over its **domain** (B.149)

[ISO 19136:2007]

B.382
range
⟨coverage⟩ **set** (B.433) of **feature attribute** (B.181) **values** (B.515) associated by a **function** (B.194) with the **elements** (B.153) of the **domain** (B.149) of a **coverage** (B.97)

[ISO 19123:2005]

B.383
raster
usually rectangular pattern of parallel scanning lines forming, or corresponding to, the display on a cathode ray tube

NOTE A raster is a **type** (B.503) of **grid** (B.234).

[ISO 19123:2005]

B.384
realization
semantic **relationship** (B.395) between **classifiers** (B.41), wherein one classifier specifies a contract that another classifier guarantees to carry out

[Booch 1999]

B.385
record
finite, named collection of related **items** (B.269) [**objects** (B.326) or **values** (B.515)]

NOTE Logically, a record is a **set** (B.433) of pairs ⟨name, item⟩.

[ISO 19107:2003]

B.386
rectified grid
grid (B.234) for which there is an affine transformation between the grid **coordinates** (B.84) and the coordinates of an external **coordinate reference system** (B.88)

NOTE If the coordinate reference system is related to the earth by a **datum** (B.124), the grid is a georectified grid.

[ISO 19123:2005]

B.387
reference data
data (B.103) accepted as representing the **universe of discourse** (B.511), to be used as reference for direct external **quality** (B.377) **evaluation** (B.169) **methods** (B.312)

[ISO 19114:2003]

B.388
referenceable grid
grid (B.234) associated with a transformation that can be used to convert grid **coordinate** (B.84) **values** (B.515) to values of coordinates referenced to an external **coordinate reference system** (B.88)

NOTE If the coordinate reference system is related to the earth by a **datum** (B.124), the grid is a georeferenceable grid.

[ISO 19123:2005]

B.389
refinement
〈UML〉 **relationship** (B.395) that represents a fuller **specification** (B.448) of something that has already been specified at a certain level of detail

NOTE For example, a design **class** (B.40) is a refinement of an analysis class.

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.390
register
set (B.433) of **files** (B.190) containing **identifiers** (B.239) assigned to **items** (B.269) with descriptions of the associated items

[ISO 19135:2005 – adapted from Annex E of the ISO/IEC JTC 1, Procedures]

B.391
register manager
organization to which management of a **register** (B.390) has been delegated by the **register owner** (B.392)

NOTE In the case of an ISO register, the register manager performs the **functions** (B.194) of the **registration** (B.393) authority specified in the ISO/IEC Directives.

[ISO 19135:2005]

B.392
register owner
organization that establishes a **register** (B.390)

[ISO 19135:2005]

B.393
registration
assignment of a permanent, unique, and unambiguous **identifier** (B.239) to an **item** (B.269)

[ISO 19135:2005 – adapted from Annex E of the ISO/IEC JTC 1, Procedures]

B.394
registry
information (B.250) system on which a **register** (B.390) is maintained

[ISO 19135:2005 – adapted from ISO/IEC 11179-3:2003]

B.395
relationship
〈UML〉 semantic connection among **model** (B.314) **elements** (B.153)

NOTE Kinds of relationships include **association** (B.16), **generalization** (B.198), metarelationship, flow and several kinds grouped under **dependency** (B.128).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.396
relative position
position (B.365) of a **point** (B.352) with respect to the positions of other points

NOTE The spatial **relationship** (B.395) of one point relative to another may be one-, two- or three-dimensional.

[ISO 19116:2004]

B.397
relative positional accuracy
closeness of **coordinate** (B.84) difference **value** (B.515) to the true or accepted value in a specified reference system

NOTE Closely related **terms** (B.475) such as local **accuracy** (B.7) are employed in various countries, agencies and application groups. Where such terms are utilized, it is necessary to provide a description of the term.

[ISO 19116:2004]

B.398
remote sensing
collection and interpretation of **information** (B.250) about an **object** (B.326) without being in physical contact with the object

[ISO/TS 19101-2:2008]

B.399
request
invocation of an **operation** (B.332) by a **client** (B.42)

[ISO 19128:2005]

B.400
resolution (of a sensor)
smallest difference between indications of a **sensor** (B.423) that can be meaningfully distinguished

NOTE For **imagery** (B.243), resolution refers to radiometric, spectral, spatial and temporal resolutions.

[ISO/TS 19101-2:2008]

B.401
resource
asset or means that fulfils a requirement

EXAMPLE **Dataset** (B.122), **service** (B.427), document, person or organization.

[ISO 19115:2003]

B.402
resource
〈ICT〉 **digital item** (B.134) controlled by a system participant

[ISO 19132:2007]

B.403
response
result of an **operation** (B.332) returned from a **server** (B.426) to a **client** (B.42)

[ISO 19128:2005]

B.404
retirement
declaration that a **register** (B.390) **item** (B.269) is no longer suitable for use in the production of new **data** (B.103)

NOTE The status of the retired item changes from “valid” to “retired”. A retired item is kept in the register to support the interpretation of data produced before its retirement.

[ISO 19135:2005]

B.405
right
action, activity or **class** (B.40) of actions that a system participant may perform on or using an associated **resource** (B.402)

[ISO 19132:2007]

B.406
rights management
control, management, allocation and **tracking** (B.492) of the **rights** (B.405) granted to system participants

[ISO 19132:2007]

B.407
ring
simple (B.435) **curve** (B.99) which is a **cycle** (B.101)

NOTE Rings are used to describe **boundary** (B.27) **components** (B.50) of **surfaces** (B.460) in 2D and 3D **coordinate systems** (B.90).

[ISO 19107:2003]

B.408
robustness testing
process of determining how well an IUT processes **data** (B.103) that contains **errors** (B.168)

NOTE This is not a part of **conformance testing** (B.73).

[ISO 19105:2000]

B.409
route
sequence (B.425) of **links** (B.287) and/or partial links that describe a path, usually between two **positions** (B.365), within a **network** (B.322)

[ISO 19133:2005]

B.410
route instruction
information (B.250) needed at a **point** (B.352) along a **route** (B.409) in a **network** (B.322) that allows that route to be traversed

NOTE To minimize the number of instructions needed to complete a **route traversal** (B.411), a default instruction can be assumed at **junctions** (B.273) without specifically associated instructions. This default is called the **main-road rule** (B.295).

[ISO 19133:2005]

B.411
route traversal
process of following a **route** (B.409)

[ISO 19133:2005]

B.412
routing
finding of optimal [minimal **cost function** (B.95)] **routes** (B.409) between **locations** (B.291) in a **network** (B.322)

[ISO 19133:2005]

B.413
satellite positioning system
positioning system (B.367) based upon receipt of signals broadcast from satellites

NOTE In this context, satellite positioning implies the use of radio signals transmitted from “active” artificial **objects** (B.326) orbiting the Earth and received by “passive” instruments on or near the Earth's **surface** (B.460) to determine **position** (B.365), velocity, and/or **attitude** (B.17) of an object. Examples are GPS and GLONASS.

[ISO 19116:2004]

B.414
schema
formal description of a **model** (B.314)

[ISO 19101:2002]

B.415
schema
〈XML Schema〉 collection of schema **components** (B.50) within the same **target** (B.465) **namespace** (B.318)

EXAMPLE Schema components of W3C XML Schema are **types** (B.503), **elements** (B.153), **attributes** (B.19), groups, etc.

[ISO 19136:2007]

B.416
schema document
〈XML Schema〉 XML document containing **schema** (B.415) **component** (B.50) **definitions** (B.126) and declarations

NOTE The W3C XML Schema provides an XML interchange format for schema **information** (B.250). A single schema document provides descriptions of components associated with a single XML **namespace** (B.318), but several documents may describe components in the same schema, i.e. the same target namespace.

[ISO 19136:2007]

B.417
schema model
representation **model** (B.314) for storing **schemas** (B.414)

EXAMPLE Representation model for a schema repository.

[ISO 19118:2005]

B.418
scene
spectral **radiances** (B.379) of a view of the natural world as measured from a specified vantage **point** (B.352) in space and at a specified time

NOTE A scene may correspond to a remotely sensed view of the natural world or to a computer-generated virtual scene simulating such a view.

[derived from ISO 22028-1]

B.419
segment
point (B.352) or **polygon** (B.356) from a **set** (B.433)

[ISO 19132:2007]

B.420
semantic type
category of **objects** (B.326) that share some common characteristics and are thus given an identifying **type** (B.503) name in a particular **domain** (B.149) of discourse

[ISO 19136:2007]

B.421
semi-major axis
a

semi-diameter of the longest axis of an **ellipsoid** (B.154)

NOTE This equates to the semi-diameter of the ellipsoid measured in its equatorial plane.

[ISO 19111:2007]

B.422
semi-minor axis
b
semi-diameter of the shortest axis of an **ellipsoid** (B.154)

NOTE The shortest axis coincides with the rotation axis of the ellipsoid and therefore contains both poles.

[ISO 19111:2007]

B.423
sensor
element (B.153) of a measuring instrument or measuring chain that is directly affected by the **measurand** (B.302)

[International Vocabulary of Basic and General Terms in Metrology (VIM)]

B.424
sensor model
description of the radiometric and geometric characteristics of a sensor

[ISO/TS 19101-2:2008]

B.425
sequence
finite, ordered collection of related **items** (B.269) [**objects** (B.326) or **values** (B.515)] that may be repeated

NOTE Logically, a sequence is a **set** (B.433) of pairs ⟨item, offset⟩. LISP syntax, which delimits sequences with parentheses and separates **elements** (B.153) in the sequence with commas, is used in this International Standard.

[ISO 19107:2003]

B.426
server
a particular **instance** (B.253) of a **service** (B.427)

[ISO 19128:2005]

B.427
service
distinct part of the functionality that is provided by an entity through **interfaces** (B.260)

NOTE See 7.2 of ISO 19119 for a discussion of service.

[ISO 19119:2005 – adapted from ISO/IEC TR 14252]

B.428
service broker
application (B.14) that combines or offers lower-level **services** (B.427) for specific **user** (B.512) needs

[ISO 19132:2007]

B.429
service chain
sequence (B.425) of **services** (B.427) where, for each adjacent pair of services, occurrence of the first action is necessary for the occurrence of the second action

[ISO 19119:2005]

B.430
service-oriented architecture
SOA
software architecture consisting of coupled **services** (B.427)

NOTE The most common SOAs in use today are Web services (using SOAP, UDDI, and WSDL), CORBA and DCOM.

[ISO 19132:2007]

B.431
service interface
shared **boundary** (B.27) between an automated system or human being and another automated system or human being

[ISO 19101:2002]

B.432
service metadata
metadata (B.306) describing the **operations** (B.332) and **geographic information** (B.211) available at a **server** (B.426)

[ISO 19128:2005]

B.433
set
unordered collection of related **items** (B.269) [**objects** (B.326) or **values** (B.515)] with no repetition

[ISO 19107:2003]

B.434
shell
simple (B.435) **surface** (B.460) which is a **cycle** (B.101)

NOTE Shells are used to describe **boundary** (B.27) **components** (B.50) of **solids** (B.438) in 3D **coordinate systems** (B.90).

[ISO 19107:2003]

B.435
simple
property of a **geometric object** (B.219) such that its **interior** (B.262) is isotropic [all **points** (B.352) have isomorphic **neighbourhoods** (B.321)], and hence everywhere locally isomorphic to an open subset of a Euclidean **coordinate** (B.84) space of the appropriate dimension

NOTE This implies that no interior **direct position** (B.138) is involved in a self-intersection of any kind.

[ISO 19107:2003]

B.436
simple feature
feature (B.179) restricted to 2D geometry with linear interpolation between vertices, having both spatial and non-**spatial attributes** (B.441)

[ISO 19125-1:2004]

B.437
slope
rate of change of elevation with respect to **curve** (B.99) length

[ISO 19133:2005]

B.438
solid
3-dimensional **geometric primitive** (B.220) representing the continuous image of a region of Euclidean 3-space

NOTE A solid is realizable locally as a three-parameter **set** (B.433) of **direct positions** (B.138). The **boundary** (B.27) of a solid is the set of oriented, closed **surfaces** (B.460) that comprise the limits of the solid.

[ISO 19107:2003]

B.439
source reference
reference to the source of an **item** (B.269) that has been adopted from a source external to the **register** (B.390)

[ISO 19135:2005]

B.440
spacestamp
value (B.515) of a **spatial attribute** (B.441) of an **object** (B.326) at a given time, at which time the object's **state** (B.452) is measured and recorded

NOTE See **timestamp** (B.484).

[ISO 19132:2007]

B.441
spatial attribute
feature attribute (B.181) describing the spatial representation of the **feature** (B.179) by **coordinates** (B.84), mathematical **functions** (B.194) and/or **boundary** (B.27) topology **relationships** (B.395)

[ISO 19117:2005]

B.442
spatial object
object (B.326) used for representing a spatial characteristic of a **feature** (B.179)

[ISO 19107:2003]

B.443
spatial operator
function (B.194) or procedure that has at least one spatial parameter in its **domain** (B.149) or **range** (B.381)

NOTE Any UML **operation** (B.333) on a **spatial object** (B.442) would be classified as a spatial operator as are the query operators in Clause 8 of ISO 19107.

[ISO 19107:2003]

B.444
spatial reference
description of **position** (B.365) in the real world

NOTE This may take the form of a label, **code** (B.46) or **coordinate tuple** (B.92).

[ISO 19111:2007]

B.445
spatial reference system
system for identifying **position** (B.365) in the real world

[ISO 19112:2003]

B.446
spatiotemporal domain
⟨coverage⟩ **domain** (B.149) composed of **spatiotemporal objects** (B.447)

NOTE The spatiotemporal domain of a **continuous coverage** (B.79) consists of a **set** (B.433) of **direct positions** (B.138) defined in relation to a collection of spatiotemporal objects.

[ISO 19123:2005]

B.447
spatiotemporal object
object (B.326) representing a **set** (B.433) of **direct positions** (B.138) in space and time

[ISO 19123:2005]

B.448
specification
⟨UML⟩ declarative description of what something is or does

NOTE Contrast: **Implementation** (B.244).

[ISO/TS 9103:2005 – adapted from ISO/IEC 19501]

B.449
spherical coordinate system
three-dimensional **coordinate system** (B.90) with one distance measured from the origin and two angular **coordinates** (B.84), commonly associated with a **geodetic coordinate reference system** (B.200)

NOTE Not to be confused with an **ellipsoidal coordinate system** (B.155) based on an **ellipsoid** (B.154) "degenerated" into a sphere.

[ISO 19111:2007]

B.450
start node
node (B.323) in the **boundary** (B.27) of an **edge** (B.151) that corresponds to the **start point** (B.451) of that edge as a **curve** (B.99) in a valid **geometric realization** (B.221) of the **topological complex** (B.486) in which the edge is used

[ISO 19107:2003]

B.451
start point
first **point** (B.352) of a **curve** (B.99)

[ISO 19107:2003]

B.452
state
〈of an object〉 persistent **data** (B.103) **object** (B.326) reflecting the internal **values** (B.515) of all the member **attributes** (B.18) or measurable descriptions of an object at a given time

NOTE State is usually associated to an object by its **identity** (B.240) and to a time by a **timestamp** (B.484).

[ISO 19132:2007]

B.453
stereotype
〈UML〉 new **type** (B.503) of modeling **element** (B.153) that extends the semantics of the **metamodel** (B.311)

NOTE Stereotypes must be based on certain existing types or **classes** (B.40) in the metamodel. Stereotypes may extend the semantics, but not the structure of pre-existing types and classes. Certain stereotypes are predefined in the UML, others may be **user** (B.512) defined. Stereotypes are one of three extensibility mechanisms in UML. The others are **constraint** (B.77) and **tagged value** (B.464).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.454
strong substitutability
ability for any **instance** (B.253) of a **class** (B.40) that is a descendant under **inheritance** (B.252) or **realization** (B.384) of another class, **type** (B.503) or **interface** (B.260) to be used in lieu of an instance of its ancestor in any context

NOTE The weaker forms of substitutability make various restrictions on the context of the implied substitution.

[ISO 19107:2003]

B.455
subcomplex
complex all of whose **elements** (B.153) are also in a larger complex

NOTE Since the **definitions** (B.126) of **geometric complex** (B.217) and **topological complex** (B.486) require only that they be closed under **boundary** (B.27) **operations** (B.332), the **set** (B.433) of any primitives of a particular dimension and below is always a subcomplex of the original, larger complex. Thus, any full **planar topological complex** (B.351) contains an **edge-node graph** (B.152) as a subcomplex.

[ISO 19107:2003]

B.456
submitting organization
organization authorised by a **register owner** (B.392) to propose changes to the content of a **register** (B.390)

[ISO 19135:2005]

B.457
subordinate concept
narrower concept
concept (B.60) which is either a specific concept or a partitive concept

[ISO 1087-1:2000]

B.458
subregister
part of a **hierarchical register** (B.237) that contains **items** (B.269) from a partition of a **domain** (B.149) of **information** (B.250)

[ISO 19135:2005]

B.459
supersession
replacement of a **register** (B.390) **item** (B.269) by one or more new items

NOTE The status of the replaced item changes from “valid” to “superseded”.

[ISO 19135:2005]

B.460
surface
2-dimensional **geometric primitive** (B.220), locally representing a continuous image of a region of a plane

NOTE The **boundary** (B.27) of a surface is the **set** (B.433) of oriented, closed **curves** (B.99) that delineate the limits of the surface. Surfaces that are isomorphic to a sphere, or to an *n*-torus (a topological sphere with *n* “handles”) have no boundary. Such surfaces are called **cycles** (B.101).

[ISO 19107:2003]

B.461
surface patch
2-dimensional, **connected** (B.74) **geometric object** (B.219) used to represent a continuous portion of a **surface** (B.460) using homogeneous interpolation and **definition** (B.126) **methods** (B.312)

[ISO 19107:2003]

B.462
SUT
System Under Test
computer hardware, software and communication **network** (B.322) required to support IUT

[ISO 19105:2000]

B.463
tag
〈XML〉 markup in an XML document delimiting the content of an **element** (B.153)

EXAMPLE 〈Road〉

NOTE A tag with no forward slash (e.g. 〈Road〉) is called a start-tag (also opening tag), and one with a forward slash (e.g. 〈/Road〉 is called an end-tag (also closing tag).

[ISO 19136:2007]

B.464
tagged value
〈UML〉 explicit **definition** (B.126) of a **property** (B.376) as a name-value pair

NOTE In a tagged **value** (B.515), the name is referred as the **tag** (B.463). Certain tags are predefined in the UML; others may be **user** (B.512) defined. Tagged values are one of three extensibility mechanisms in UML. The others are **constraint** (B.77) and **stereotype** (B.453).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.465
target
object (B.326) or person subject to being located

NOTE There is little logical difference between **traveller** (B.498) and target except that the former is normally used for a moving object which is being tracked, and the latter is used for either an object that is not moving, or an object for which a **location** (B.291) is needed only once. A traveller is the subject of a **tracking** (B.492) **service** (B.427); a target is the subject of a locating service. Since this International Standard does not make a distinction between the protocols for these logically similar services, but does need to differentiate between the two **concepts** (B.60), both **terms** (B.475) will be used as appropriate to the underlying semantics of the situation. Since all of these terms refer to entities represented by objects within the system, they can be combined with adjectives defined for objects. So, an active target [a target represented by an **active object** (B.8)] can be used to represent a moving object, since the act of **motion** (B.316) is modifying the target's internal **state** (B.452) and is therefore initiating actions.

[ISO 19132:2007]

B.466
technical standard
standard containing the **definitions** (B.126) of **item classes** (B.270) requiring **registration** (B.393)

[ISO 19135:2005 – adapted from Annex E of the ISO/IEC JTC 1, Procedures]

B.467
technology viewpoint
viewpoint (B.526) on an ODP system and its environment that focuses on the choice of technology in that system

[ISO/IEC 10746-2]

B.468
temporal coordinate
distance from the origin of the **interval scale** (B.265) used as the basis for a **temporal coordinate system** (B.469)

[ISO 19108:2002]

B.469
temporal coordinate system
temporal reference system (B.473) based on an **interval scale** (B.265) on which distance is measured as a multiple of a single **unit** (B.507) of time

[ISO 19108:2002]

B.470
temporal feature association
feature association (B.180) characterized by a reference to time or to a temporal **constraint** (B.76)

[ISO 19108:2002]

B.471
temporal feature operation
feature operation (B.185) specified as a **function** (B.194) of time

[ISO 19108:2002]

B.472
temporal position
location (B.291) relative to a **temporal reference system** (B.473)

[ISO 19108:2002]

B.473
temporal reference system
reference system against which time is measured

[ISO 19108:2002]

B.474
temporal sequence
ordered **sequence** (B.425) of **timestamps** (B.484) associated to a sequence of representations of the same **object** (B.326)

NOTE Temporal sequences are not assumed to be evenly spaced in time, nor equidistant in space. For **discrete change** (B.144), the default logic is to sample at temporal **points** (B.352) of change, if possible, so that the timestamp is the first temporal **instance** (B.253) where the **attributes** (B.18) listed have taken on that combination of **values** (B.515). For the sake of space savings, some samples in a sequence only list those values that have changed since the immediately preceding temporal sample. For this reason, a sample should only be considered in the context of its containing sequence. For rigid **motions** (B.316) [such as **vehicle** (B.519) **tracking** (B.492)], only centroid (a point value) and orientation (direction of travel) are needed for a temporal sequence describing **location** (B.291) and spatial extent. A motion in combination with an object deformation would require more **information** (B.250).

[ISO 19132:2007]

B.475
term
verbal **designation** (B.132) of a general **concept** (B.60) in a specific subject field

NOTE A term may contain symbols and can have variants, e.g. different forms of spelling.

[ISO 1087-1:2000]

B.476
term equivalent
term (B.475) in another **language** (B.275) which designates the same **concept** (B.60)

NOTE A term equivalent should be accompanied by a **definition** (B.126) of the designated concept expressed in the same language as the term equivalent.

[ISO/TS 19104]

B.477
term instance classification
classification identifying the status of a **term** (B.475)

[ISO/TS 19104]

B.478
terminological record
structured collection of terminological **data** (B.103) relevant to one **concept** (B.60)

[ISO/TS 19104]

B.479
terminological record identifier
unique, unambiguous, and linguistically neutral **identifier** (B.239) assigned to a **terminological record** (B.478)

[ISO/TS 19104]

B.480
terminology repository
data (B.103) store or document in which **terms** (B.475) and their associated **definitions** (B.126) are stored or recorded

[ISO/TS 19104]

B.481
tessellation
partitioning of a space into a **set** (B.433) of conterminous subspaces having the same dimension as the space being partitioned

EXAMPLE Graphic examples of tessellations may be found in Figures 11, 13, 20 and 22 of this International Standard

NOTE A tessellation composed of congruent regular **polygons** (B.356) or polyhedra is a regular tessellation. One composed of regular, but non-congruent polygons or polyhedra is a semi-regular tessellation. Otherwise the tessellation is irregular.

[ISO 19123:2005]

B.482
testing laboratory
organization that carries out the **conformance assessment process** (B.68)

[ISO 19105:2000]

B.483
Thiessen polygon
polygon (B.356) that encloses one of a **set** (B.433) of **points** (B.352) on a plane so as to include all **direct positions** (B.138) that are closer to that point than to any other point in the set

[ISO 19123:2005]

B.484
timestamp
value (B.515) of time at which an **object's** (B.326) **state** (B.452) is measured and recorded

[ISO 19132:2007]

B.485
topological boundary
boundary (B.27) represented by a **set** (B.433) of oriented **topological primitives** (B.490) of smaller **topological dimension** (B.487) that limits the extent of a **topological object** (B.489)

NOTE The boundary of a **topological complex** (B.486) corresponds to the boundary of the **geometric realization** (B.221) of the topological complex.

[ISO 19107:2003]

B.486
topological complex
collection of **topological primitives** (B.490) that is closed under the **boundary** (B.27) **operations** (B.332)

NOTE "Closed under the boundary operations" means that if a topological primitive is in the topological complex, then its boundary **objects** (B.326) are also in the topological complex.

[ISO 19107:2003]

B.487
topological dimension
minimum number of free variables needed to distinguish nearby **direct positions** (B.138) within a **geometric object** (B.219) from one another

NOTE The free variables mentioned above can usually be thought of as a local **coordinate system** (B.90). In a 3D **coordinate** (B.84) space, a plane can be written as $P(u, v) = A + u\,X + v\,Y$, where u and v are real numbers and A is any **point** (B.352) on the plane, and X and Y are two **vectors** (B.517) tangent to the plane. Since the **locations** (B.291) on the plane can be distinguished by u and v (here universally), the plane is 2D and (u, v) is a coordinate system for the points on the plane. On generic **surfaces** (B.460), this cannot, in general, be done universally. If we take a plane tangent to the surface, and project points on the surface onto this plane, we will normally get a local **isomorphism** (B.268) for small **neighbourhoods** (B.321) of the point of tangency. This "local coordinate" system for the underlying surface is sufficient to establish the surface as a 2D **topological object** (B.489). Since this International Standard deals only with spatial coordinates, any 3D **object** (B.326) can rely on coordinates to establish its topological dimension. In a 4D **model** (B.314) (spatio-temporal), tangent spaces also play an important role in establishing the topological dimension for objects up to 3D.

[ISO 19107:2003]

B.488
topological expression
collection of oriented **topological primitives** (B.490) which is operated upon like a multivariate polynomial

NOTE Topological expressions are used for many calculations in **computational topology** (B.57).

[ISO 19107:2003]

B.489
topological object
spatial object (B.442) representing spatial characteristics that are invariant under continuous transformations

NOTE A topological object is a **topological primitive** (B.490), a collection of topological primitives, or a **topological complex** (B.486).

[ISO 19107:2003]

B.490
topological primitive
topological object (B.489) that represents a single, non-decomposable **element** (B.153)

NOTE A **topological primitive** (B.490) corresponds to the **interior** (B.262) of a **geometric primitive** (B.220) of the same dimension in a **geometric realization** (B.221).

[ISO 19107:2003]

B.491
topological solid
3-dimensional **topological primitive** (B.490)

NOTE The **boundary** (B.27) of a topological **solid** (B.438) consists of a **set** (B.433) of **directed faces** (B.140).

[ISO 19107:2003]

B.492
tracking
monitoring and reporting the **location** (B.291) of a **vehicle** (B.519)

[ISO 19133:2005]

B.493
tracking device
device [**tag** (B.463)] carried by a **vehicle** (B.519) to allow it to determine its **location** (B.291) or to be sensed by external **objects** (B.326) of known location

NOTE 1 The most common tracking devices are cell phones, GNSS chips, RFID (Radio Frequency ID) tags, or printed tags which are scannable by optical **sensors** (B.423) such as “bar codes”.

NOTE 2 The common usage of “vehicle” means a “form of conveyance” or, more simply “thing that conveys (carries) something else”. Thus, a tracked object that carries a tracking device to allow it to be tracked is, by **definition** (B.126), a conveyance or vehicle for that device. Thus, a cell phone that carries a GNSS device is the vehicle for that device, and the **traveller** (B.498) carrying the cell phone, allowing him to be tracked, is the vehicle for the phone and all of its internal electronics.

[ISO 19132:2007]

B.494
trajectory
path of a moving **point** (B.352) described by a one-parameter **set** (B.433) of points

[ISO 19141:2008]

B.495
transaction time
time when a fact is current in a database and may be retrieved

B.496
transfer protocol
common **set** (B.433) of rules for defining interactions between distributed systems

[ISO 19118:2005]

B.497
transportation mode
means that **travellers** (B.498) can choose for transportation

[ISO 19134:2007]

B.498
traveller
person subject to being navigated or tracked

NOTE 1 See **vehicle** (B.519).

NOTE 2 Includes pedestrians. See ISO 14825. In this International Standard, “traveller” can be replaced by “vehicle” without any change of intent.

[ISO 19133:2005]

B.499
traversable
condition of a **link** (B.287) or **turn** (B.502) that allows or restricts all traffic's traversal, as opposed to a more detailed **navigation constraint** (B.320)

NOTE Traversability is usually a **function** (B.194) of physical, cultural, or legal conditions. If traversable is false, then the **object** (B.326) cannot be navigated. This effectively removes a link from the usable **network** (B.322). In the case of a **node** (B.323), it effectively removes the node and all associated links from the useable network. In the case of a turn, it simply removes it from any viable **route** (B.409). Non-traversable entities are not included in **maneuvers** (B.296) or routes.

[ISO 19133:2005]

B.500
triangulated irregular network
tessellation (B.481) composed of triangles

[ISO 19123:2005]

B.501
tuple
ordered list of **values** (B.515)

NOTE The number of values in a tuple is immutable.

[ISO 19136:2007]

B.502
turn
part of a **route** (B.409) or **network** (B.322) consisting of a **junction** (B.273) **location** (B.291) and an entry and exit **link** (B.287) for that junction

[ISO 19133:2005]

B.503
type
〈UML〉 stereotyped **class** (B.40) that specifies a **domain** (B.149) of **objects** (B.326) together with the **operations** (B.333) applicable to the objects, without defining the physical **implementation** (B.244) of those objects

NOTE A type may have **attributes** (B.18) and **associations** (B.16).

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.504
UML application schema
application schema (B.15) written in UML in accordance with ISO 19109

[ISO 19136:2007]

B.505
uncertainty
parameter, associated with the result of **measurement** (B.301), that characterizes the dispersion of **values** (B.515) that could reasonably be attributed to the **measurand** (B.302)

NOTE When the **quality** (B.377) of **accuracy** (B.7) or **precision** (B.368) of measured values, such as **coordinates** (B.84), is to be characterized quantitatively, the quality parameter is an estimate of the uncertainty of the measurement results. Because accuracy is a qualitative **concept** (B.60), one should not use it quantitatively, that is associate numbers with it; numbers should be associated with **measures** (B.303) of uncertainty instead.

[Guide to the Expression of Uncertainty in Measurement (GUM), 1995]

B.506
Uniform Resource Identifier
URI
unique **identifier** (B.239) for a **resource** (B.401), structured in **conformance** (B.67) with IETF RFC 2396

NOTE The general syntax is <scheme>::<scheme-specific-part>. The hierarchical syntax with a **namespace** (B.318) is <scheme>://<authority><path>?<query>. See RFC 2396.

[ISO 19136:2007]

B.507
unit
defined quantity in which dimensioned parameters are expressed

NOTE In this International Standard, the subtypes of units are length units, angular units, time units, scale units and **pixel** (B.350) spacing units.

[ISO 19111:2007]

B.508
unit of measure
reference quantity chosen from a **unit** (B.507) equivalence group

NOTE In positioning **services** (B.427), the usual units of **measurement** (B.301) are either angular units or linear units. **Implementations** (B.244) of positioning services must clearly distinguish between SI units and non-SI units. When non-SI units are employed, it is required that their relation to SI units be specified.

[ISO 19116:2004 – adapted from ISO 31-0, 2.1]

B.509
universal face
unbounded **face** (B.176) in a 2-dimensional complex

NOTE The universal face is normally not part of any **feature** (B.179), and is used to represent the unbounded portion of the **data** (B.103) **set** (B.433). Its **interior** (B.262) **boundary** (B.27) [it has no **exterior** (B.174) boundary] would normally be considered the exterior boundary of the **map** (B.297) represented by the data set. This International Standard does not special case the universal face, but **application schemas** (B.15) may find it convenient to do so.

[ISO 19107:2003]

B.510
universal solid
unbounded **topological solid** (B.491) in a 3-dimensional complex

NOTE The universal **solid** (B.438) is the 3-dimensional counterpart of the **universal face** (B.509), and is also normally not part of any **feature** (B.179).

[ISO 19107:2003]

B.511
universe of discourse
view of the real or hypothetical world that includes everything of interest

[ISO 19101:2002]

B.512
user
active object (B.8) that initiates service **requests** (B.399) to the system

NOTE Users are usually objects that act as proxies for people accessing the functionality of the system.

[ISO 19132:2007]

B.513
valid time
time when a fact is true in the abstracted reality

[Jensen et al. (1994)]

B.514
validation
process of assessing, by independent means, the **quality** (B.377) of the **data products** (B.107) derived from the system outputs

[CEOS WGCV]

B.515
value
〈UML〉 **element** (B.153) of a **type** (B.503) **domain** (B.149)

NOTE 1 A value may consider a possible **state** (B.452) of an **object** (B.326) within a **class** (B.40) or type (domain).

NOTE 2 A **data** (B.103) value is an **instance** (B.254) of a **data type** (B.121), a value without **identity** (B.240)

[ISO/TS 19103:2005 – adapted from ISO/IEC 19501]

B.516
value domain
set (B.433) of accepted **values** (B.515)

EXAMPLE The **range** (B.381) 3-28, all integers, any ASCII **character** (B.36), enumeration of all accepted values (green, blue, white).

[ISO/TS 19103:2005]

B.517
vector
quantity having direction as well as magnitude

NOTE A directed line **segment** (B.419) represents a vector if the length and direction of the line segment are equal to the magnitude and direction of the vector. The **term** (B.475) vector **data** (B.103) refers to data that represents the spatial configuration of **feature** (B.179) as a **set** (B.433) of directed line segments.

[ISO 19123:2005]

B.518
vector geometry
representation of geometry through the use of constructive **geometric primitives** (B.220)

[ISO 19107:2003]

B.519
vehicle
object (B.326) subject to being navigated or tracked

NOTE 1 See **traveller** (B.498).

NOTE 2 Includes pedestrians. See ISO 14825. In this International Standard, “vehicle” can be replaced by “traveller” without any change of intent.

[ISO 19133:2005]

B.520
vehicle classification
type (B.503) of **vehicle** (B.519), based on the nature of its construction or intended purpose

NOTE Classifications based on construction include automobile, truck, bus, bicycle, etc. Classifications based on purpose include taxi, emergency vehicle, etc. Vehicle classification can be used to determine the **application** (B.14) of **navigation constraints** (B.320).

[ISO 19133:2005]

B.521
verification test
test developed to prove rigorously whether an IUT is correct

[ISO 19105:2000]

B.522
version (temporal)
complete representation of an **object** (B.326) at a given **instance** (B.253) in time

NOTE Temporal versions differ from samples in that a complete description is required. In this sense, a version is a complete sample able to be considered outside the **domain** (B.149) of the **temporal sequence** (B.474) to which it may belong.

[ISO 19132:2007]

B.523
vertical coordinate reference system
one-dimensional **coordinate reference system** (B.88) based on a **vertical datum** (B.525)

[ISO 19111:2007]

B.524
vertical coordinate system
one-dimensional **coordinate system** (B.90) used for **gravity-related height** (B.232) or **depth** (B.130) **measurements** (B.301)

[ISO 19111:2007]

B.525
vertical datum
datum (B.124) describing the relation of **gravity-related heights** (B.232) or **depths** (B.130) to the Earth

NOTE In most cases, the vertical datum will be related to **mean sea level** (B.299). **Ellipsoidal heights** (B.156) are treated as related to a three-dimensional **ellipsoidal coordinate system** (B.155) referenced to a **geodetic datum** (B.202). Vertical datums include sounding datums (used for hydrographic purposes), in which case the **heights** (B.236) may be negative heights or depths.

[ISO 19111:2007]

B.526
viewpoint
〈on a system〉 form of abstraction achieved using a selected **set** (B.433) of architectural **concepts** (B.60) and structuring rules, in order to focus on particular concerns within a system

[ISO/IEC 10746-2:1996]

B.527
waypoint
location (B.291) on the **network** (B.322) that plays a role in choosing **candidate routes** (B.32) potentially satisfying a **routing** (B.412) **request** (B.399)

[ISO 19133:2005]

B.528
workflow
automation of a business process, in whole or part, during which documents, **information** (B.250) or tasks are passed from one participant to another for action, according to a **set** (B.433) of procedural rules

[ISO 19119:2005]

B.529
zero meridian
prime meridian
meridian (B.305) from which the longitudes of other meridians are quantified

[ISO 19111:2007]

Annex C
(normative)

Principles for definition writing

C.1 Basic principles

For the purpose of creating the terminology standard, the following basic principles, based on ISO 10241, shall apply.

C.1.1 Standardized definitions shall be used whenever possible.

C.1.2 Definitions shall have the same grammatical form as the term; to define a verb, a verbal phrase shall be used; to define a singular noun, the singular shall be used.

C.1.3 Definitions shall not begin with expressions such as “term used to describe...” or “term denoting...”, neither shall they take the form “term is...” or “term means...”.

C.1.4 Definitions shall not be given in full-sentence form.

C.1.5 Definitions shall be lower case, including the first letter, except for any upper-case letters required by the normal spelling of a word in running text.

C.1.6 Definitions shall not begin with an article.

C.1.7 References to other entries in the vocabulary shall be indicated by using a preferred term defined elsewhere in the vocabulary.

C.1.8 References to standardized definitions shall be presented within square brackets after the definition.

C.1.9 Where a standardized definition in another field has to be adapted, an explanation shall be given in a note.

C.2 Developing definitions

The following principles for developing definitions, taken from ISO 704, shall be used.

C.2.1 A definition shall describe a concept, not the words that make up a designation.

C.2.2 Before drafting a definition for a given concept, it is necessary to determine the relations between the concept and its related concepts and to model a concept system within which the concept is situated.

C.2.3 If a definition already exists, in a standard for example, it shall be adopted as it stands only if it reflects the concept system in question. Otherwise it shall be adapted.

C.2.4 When modelling the concept system and formulating the corresponding system of definitions, it is essential to determine which concepts are so basic and familiar that they need not be defined. Generally, one begins by defining superordinate concepts. When drafting a new definition, use shall be made of basic concepts or concepts defined elsewhere in the document as far as possible.

C.2.5 A definition shall reflect the concept system describing the concept and its relations to others in the system. Definitions shall be co-ordinated so as to be able to reconstruct the concept system. The characteristics used in the definition should therefore be selected to indicate the connection between the concepts or the delimitation that distinguishes one concept from another.

C.2.6 Definitions shall be as brief as possible and as complex as necessary. Complex definitions can contain several dependent clauses, but carefully written definitions contain only that information which makes the concept unique. Any additional descriptive information deemed necessary should be included in a note.

C.2.7 A definition shall describe only one concept. It shall not include hidden definitions for any concepts used to identify characteristics. Any characteristic that requires an explanation shall be defined separately as a concept or given in a note.

C.2.8 A definition should not contain characteristics that belong logically to superordinate or subordinate concepts.

C.2.9 The extension and the characteristics reflected in a definition shall be appropriate to the concept system in a given subject field.

C.2.10 If the specific field of the concept is not clearly indicated in the designation or is not generally understood, it shall be added to the beginning of the definition.

C.2.11 The substitution principle shall be used to test the validity of a definition. A definition is valid if it can replace a designation in the text without loss of, or change in, meaning.

C.2.12 If one concept is defined using a second concept, and that second concept is defined using the term or elements of the term designating the first concept, the resulting definitions are said to be circular. Circular definitions do not add to our understanding of the concept and shall be avoided as much as possible.

C.2.13 A definition is circular within a system of definitions when two or more concepts are defined by means of each other. The substitution principle clearly reveals repetition and circularity.

C.2.14 A definition shall describe the content of the concept precisely. It shall be neither too narrow nor too broad. Otherwise, the definition is considered incomplete. A definition shall describe what a concept is, not what it is not.

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