INTERNATIONAL STANDARD

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Terminology work — Principles and methods

Travail terminologique — Principes et méthodes

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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 3.

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

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

International Standard ISO 704 was prepared by Technical Committee ISO/TC 37, *Terminology (principles and coordination)*, Subcommittee SC 1, *Principles of terminology*.

This second edition cancels and replaces the first edition (ISO 704:1987), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

0 Introduction

0.1 Overview

The terminological principles and methods laid down in this International Standard are based on current thinking and practices in terminology.

Terminology is multidisciplinary and draws support from a number of disciplines (e.g., logic, epistemology, philosophy of science, linguistics, information science and cognitive sciences) in its study of concepts and their representations in special language. It combines elements from many theoretical approaches that deal with the description, ordering and transfer of knowledge.

In line with current standardization trends to include guiding principles, this International Standard is intended to standardize the essential elements for quality work in terminology. The general purpose of this International Standard is to provide a common framework of thinking and explain how this thinking should be implemented by an organization or individuals involved in terminology.

It is further intended to provide assistance to those involved in terminology management. The principles and methods should be observed not only for the manipulation of terminological information but also in the planning and decision-making involved in managing a stock of terminology. The main activities include, but are not limited to the following:

— identifying concepts and concept relations;

— analysing and modelling concept systems on the basis of identified concepts and concept relations;

— establishing representations of concept systems through concept diagrams;

— defining concepts;

— attributing designations (predominantly terms) to each concept in one or more languages;

— recording and presenting terminological data, principally in print and electronic media (terminography).

Objects, concepts, designations and definitions are fundamental to terminology and therefore form the basis of this International Standard. Objects are perceived or conceived and abstracted into concepts which, in special language, are represented by designations and described in definitions. A set of designations belonging to one special language constitutes the terminology of a specific subject field.

0.2 Conventions and notation

In this International Standard and for the English language, “terminology” used in the singular and without an article designates the discipline, while “terminology” used in the plural or preceded by an article refers to the set of designations of a particular subject field, such as the terminology of chemistry.

For the sake of consistency in reference to objects, concepts, definitions and designations, the following wording conventions are used in this International Standard:

— objects

  are **perceived** or **conceived**;

  are **abstracted** or **conceptualized** into concepts;

— concepts

depict or **correspond** to a set of objects;

are **represented** or **expressed in language** by designations or by definitions;

are **organized into concept systems**;

— designations (terms, appellations or symbols)

designate or **represent** a concept;

are **attributed to** a concept;

— definitions

define or **describe** the concept.

The more complex a concept system, the more useful it is to clarify relations among concepts by representing them formally or graphically. Concept relations can be represented formally in a list. The formal representation used in this International Standard is a numbered and indented list as exemplified by the following:

1. [ ]

1.1 [ ]

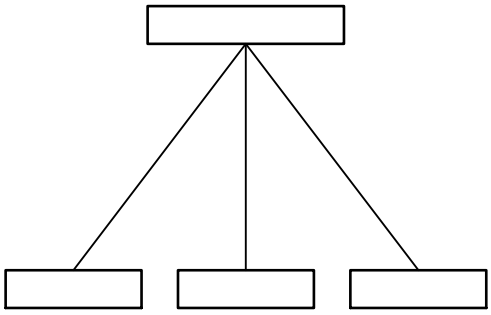
1.2 [ ]

2. [ ]

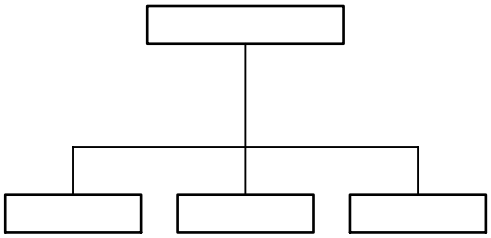
2.1 [ ]

2.2 [ ]

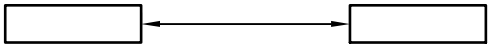
The graphic representations used in this International Standard are the most typical ones.



Tree diagram to represent generic concept relations



Rake or bracket diagram to represent partitive concept relations



Line with arrowheads at each end to represent associative concept relations

The notation used throughout this International Standard is as follows:

— terms defined in ISO 1087-1 are in italics;

— concepts are indicated by single quotes;

— designations (terms, appellations or symbols) are in boldface;

— characteristics are underlined;

— examples are boxed.

It should be noted that the examples in this International Standard have been chosen and simplified for illustrative purposes. The translation into other languages may necessitate the selection of other examples to illustrate the point.

It should also be noted that the examples of term-formation methods, in informative annex A, are specific to the English language in the English version and to the French language in the French version. Annex A should not be translated but adapted to the needs of each language.

Terminology work — Principles and methods

1 Scope

This International Standard establishes and harmonizes the basic principles and methods for preparing and compiling terminologies both inside and outside the framework of standardization.

This International Standard describes the links between objects, concepts, and their representations through the use of terminologies. It also establishes general principles governing the formation of designations and the formulation of definitions. Full and complete understanding of these principles requires some background knowledge of terminology. The principles are general in nature and this International Standard is applicable to terminology work in scientific, technological, industrial, administrative, and other fields of knowledge.

This International Standard does not stipulate procedures for the layout of International Terminology Standards that are treated in ISO 10241.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 9:1995, *Information and documentation —Transliteration of Cyrillic characters into Latin characters — Slavic and non-Slavic languages.*

ISO 233:1984, *Documentation — Transliteration of Arabic characters into Latin characters.*

ISO 233-2:1993, *Information and documentation — Transliteration of Arabic characters into Latin characters — Part 2: Arabic language — Simplified transliteration.*

ISO 233-3:1999, *Information and documentation — Transliteration of Arabic characters into Latin characters — Part 3: Persian language — Simplified transliteration.*

ISO 259:1984, *Documentation — Transliteration of Hebrew characters into Latin characters.*

ISO 259-2:1994, *Information and documentation — Transliteration of Hebrew characters into Latin characters — Part 2: Simplified transliteration.*

ISO 843:1997, *Information and documentation — Conversion of Greek characters into Latin characters.*

ISO 860:1996, *Terminology work — Harmonization of concepts and terms.*

ISO 1087-1:—[1)], *Terminology work — Vocabulary — Part 1: Theory and application.*

ISO 3602:1989, *Documentation — Romanization of Japanese (kana script).*

ISO 7098:1991, *Information and documentation — Romanization of Chinese*.

ISO 10241:1992, *International terminology standards — Preparation and layout.*

3 Terms and definitions

For the purposes of this International Standard, the definitions given in ISO 1087-1 apply. The terminology defined in ISO 1087-1 appears as italicized terms in this International Standard. It should be noted that terms not italicized but found and defined in ISO 1087-1 are to be interpreted by their general language meaning.

4 Objects

For the purposes of this International Standard, an *object* is defined as anything perceived or conceived. Some *objects*, concrete objects such as a machine, a diamond, or a river, shall be considered material; other *objects* shall be considered immaterial or abstract, such as each manifestation of financial planning, gravity, flowability, or a conversion ratio; still others shall be considered purely imagined, for example, a unicorn**,** a philosopher's stone or a literary character. In the course of producing a *terminology*, philosophical discussions on whether an *object* actually exists in reality are beyond the scope of this International Standard and shall be avoided. *Objects* are assumed to exist and attention shall be focused on how one deals with *objects* for the purposes of communication.

5 Concepts

5.1 Nature of concepts for terminology

To communicate, not every individual *object* in the world is differentiated and named. Instead, through observation and a process of abstraction called conceptualization, *objects* are categorized into mental constructs or units of thought called *concepts* which are represented in various forms of communication (*object* → *concept* → communication). This International Standard does not deal with all *concepts* represented in language but only with those represented by *terminologies.* For *terminology, concepts* are to be considered mental representations of *objects* within a specialized context or field.

Concepts are not to be confused with abstract or imagined *objects* (i.e., concrete, abstract or imagined objects in a given context are observed and conceptualized mentally and then a *designation* is attributed to the *concept* rather than to the *objects* themselves). For this International Standard, the link between an *object* and its *designation* or *definition* is made through the *concept,* a higher level of abstraction.

Producing a *terminology* requires understanding the conceptualization that underpins human knowledge in a subject area. Because a *terminology* always deals with *special language* in a particular field of knowledge, the *concept* shall be viewed not only as a unit of thought but also as a unit of knowledge.

The *concepts* contextualized in the *special language* of the *subject field* can be expressed in the various forms of human communication according to the system used. In natural language, *concepts* can take the form of *terms*, *appellations*, *definitions* or other linguistic forms; in artificial language, they can take the form of codes or formulae while in graphics, they can take the form of icons, pictures, diagrams or other graphic representations. *Concepts* may also be expressed with the human body as they are in sign language, facial expressions or body movements. This International Standard does not deal with the expression of *concepts* by sign or body language.

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1) To be published.

5.2 Individual and general concepts

When the *concept* depicts a single *object*, it is called an *individual concept* and is represented in *special language* as an *appellation* (e.g., United Nations, Internet, Worldwide Web) or a *symbol* (e.g:  Möbius Loop;  Africa;  Statue of Liberty). When the *concept* depicts a set of two or more *objects*, it is called a *general concept* and, in *special languages,* the *designation* takes the form of a *term* (e.g., floppy disk, liquidity, money market fund, etc.) or a symbol (©, ⩾, $).

5.3 Characteristics

5.3.1 Nature of characteristics

Concept formation plays a pivotal role in organizing human knowledge because it provides the means for recognizing *objects* and for grouping them into meaningful units in a particular field. *Objects* perceived as sharing the same properties are grouped into units. Once similar *objects*, or occasionally a single *object*, are viewed as a meaningful unit of thought within a branch of human knowledge, the properties of an *object* or common to a set of *objects* are abstracted as *characteristics* which are combined as a set in the formation of a *concept*. *Characteristics* are constantly being combined in order to create *concepts,* although differently in different cultures, fields or schools of thought. The combination of unique sets of *characteristics* is represented in *special language* by a *designation* (i.e., a *term*, *appellation* or *symbol*). Since a *designation* is not attributed to every individual *object,* terminological analysis cannot begin unless the specific *object* in question corresponds to a *concept* represented by means of a *designation* or a *definition.* Therefore, the methodology used in the analysis of *terminologies* requires identifying the context or *subject field* in question, identifying the properties attributed to *objects* in the *subject field*, determining those properties which are abstracted into *characteristics* and then combining the *characteristics* to form a *concept*. It may be useful to begin an analysis with those *concepts* corresponding to concrete objects, since the *characteristics* are more easily abstracted given that the properties of the *objects* can be physically observed or examined.

Terminological analysis shall begin with the *objects* in question and the *subject field* contextualizing the *objects* in question. Properties shall be ascribed only to *objects*.

EXAMPLE 1

The specific *object* designated by the visual representation below has the following specific properties:

— made of a long, thin piece of graphite;

— the graphite core is surrounded by a wood casing;

— the casing is yellow;

— at one end there is an eraser;

— at the other end, the graphite and casing have been sharpened to a point;

— it is used for writing or making marks.

If the *object* in example 1 is contextualized in the field of stationery, this particular *object* is recognized as belonging to the category of *objects* that has been conceptualized as lead pencil. In the process of conceptualization, the properties of the *objects* forming the set are abstracted into *characteristics*, that is, the properties of the *object* are converted into generalizations applied to the entire set as opposed to the individual *object*, as illustrated in example 2.

Like the properties of *objects*, *characteristics* are grouped into *types of characteristics* such as colour, composition, function, use, origin, shape, location, movement, etc. To obtain a comprehensive listing, the properties of numerous *objects* corresponding to the *concept* under analysis should be identified followed by their abstraction as *characteristics*. For practical purposes, beginning with one of the more typical *objects* is recommended. The identification of *characteristics* shall be based on specialized subject knowledge of the field and often requires research. Experienced terminologists for whom the *concept* in question is clear and straightforward may move directly to identifying the *characteristics*.

The following example is a preliminary analysis of the *concept* 'lead pencil'.

EXAMPLE 2

	Object (visual representation): 	***Concept:*** abstraction based on the set of all lead pencils	***Designation (term):*** **Lead pencil**
Category	***Property***		***Characteristic***
Level of abstraction	Concreteness		Concreteness
Composition	Made of a long, thin piece of graphite		Graphite core
Composition	Wood casing surrounds graphite		Graphite core is encased in wood
Colour	Casing is yellow		Casing may be any colour
Composition	At one end there is an eraser		One end may have an eraser
Shape	Other end is sharpened to a point		One end may be sharpened to a point
Usage	Graphite and casing sharpened for usage		Graphite and casing must be sharpened for usage
Medium	Graphite is the writing medium		Graphite is the writing medium
Function	Used for writing or making marks		Used for writing or making marks

Characteristics shall be used in the analysis of *concepts,* the modelling of *concept systems,* in the formation of *definitions* and, as often as possible**,** in the formation of *designations*.

5.3.2 Intension and extension

The set of *characteristics* that come together as a unit to form the *concept* is called the *intension*. The *objects* viewed as a set and conceptualized into a *concept* are known as the *extension*. The two, *intension* and *extension,* are interdependent. For example, the *characteristics* making up the *intension* of 'lead pencil' determines the *extension*, those *objects* that qualify as lead pencils and vice versa.

5.3.3 Essential vs. non-essential characteristics

Not all *characteristics* are equally important. For practical purposes, the *essential characteristics* of the *intension* shall be the focal point of any analysis and may differ according to specific fields. *Characteristics* are considered essential if they are indispensable for the understanding of the *concept* in a particular field of knowledge; the absence of an *essential characteristic* fundamentally changes the *concept*. The absence of an *essential characteristic* in the course of an analysis will lead to poor or even erroneous understanding of the *concept*. In the example of the 'lead pencil', if the *characteristic* graphite core is encased in wood were removed, the *concept* would be radically changed. It would represent a different *concept* corresponding to a different set of *objects*. Therefore, this is an *essential characteristic*. On the other hand, if the *characteristic* one end may be sharpened to a point were removed**,** the *concept* would not be altered. Although a lead pencil must be sharpened in order to write, it still qualifies as a lead pencil, even if it has not been sharpened. Therefore, this *characteristic* is not essential to the understanding of the *concept* of 'lead pencil'. The *essential characteristics* of a *concept,* such as 'lead pencil', shall be identified. It is not always necessary to categorize the *characteristics* explicitly as in example 3; only in cases where the *concept* in question is highly complex.

EXAMPLE 3

Level of abstraction	1 Concreteness	Essential
Composition	2. Graphite core	Essential
Composition	3. Graphite is encased in wood	Essential
Colour	4. Casing may be coloured	Non-essential
Composition	5. One end may have an eraser	Non-essential
Shape	6. One end may be sharpened to a point	Non-essential
Usage	7. Must be sharpened for usage	Essential
Medium	8. Graphite is the writing medium	Essential
Function	9. Used for writing or making marks	Essential

It must be noted that the same property of a given *object* may be abstracted as an *essential characteristic* of a *concept* in one *subject field* but may be non-essential in another.

5.3.4 Delimiting characteristics

After identifying the *essential characteristics* that make up the *intension* of a *concept,* the terminological analysis shall be taken a step further. Each e*ssential characteristic* of the *concept* under study shall be analysed in relation to the related *concepts* in the *concept* system. Common or shared characteristics indicate similarities between *concepts*; *delimiting characteristics* signal differences which set a *concept* apart (see examples 7 and 8). A *delimiting characteristic* is an *essential characteristic* that distinguishes one *concept* from another. However, delimiting and common are relative terms. The same *essential characteristic* may be delimiting in relation to one *concept* but common in relation to another related *concept*. Analysing the similarities and differences between *concepts* will result in the unique set of *characteristics* that typify a given *concept.* This unique combination of *characteristics* will situate the *concept* within a network of related *concepts* with similar or different *characteristics.* The relations between the *concepts* shall be used to determine the basic structure of the *concept system*. Understanding the *characteristics* used to develop the *concept system* simplifies the task of defining a *concept*.

5.4 Concept relations

5.4.1 Types of concept relations

Concepts do not exist as isolated units of thought but always in relation to each other. Our thought processes constantly create and refine the relations between *concepts*, whether these relations are formally acknowledged or not.

In organizing *concepts* into a *concept system*, it is necessary to bear in mind the field of knowledge that gave rise to the *concept* and to consider the expectations and objectives of the target users. The *subject field* shall act as the framework within which the *concept field,* the set of related but unstructured *concepts,* is established.

EXAMPLE 4

If our task were to list and compile the *terminology* of writing instruments for the stationery industry, our example of ‘lead pencil’ would form part of the *concept field* dealing with pencils as conceptualized by those in the stationery industry. Pencils outside the field of stationery, such as eyebrow pencil or styptic pencil, would be excluded.