Standards for Terminology Work

Hendrik J. Kockaert
Theoretical Background

Classical Theory
- objectivist epistemology
- onomasiological definition
- concepts

Prototype Theory
- cognitivist epistemology
- semasiological templates for meaning
- description
- categories
Based on Objectivist Epistemology

Reality
Entities with fixed properties and relations among them

Essentialism
Necessary and sufficient properties define a category
[Aristotelian logic]
Classical categorisation

Entities that have a given property or collection of properties in common form a category
Objectivist semantics & Correspondence Theory

Linguistic expressions get their meaning only via their capacity to correspond, or failure to correspond, to the real world or some possible world.

They are capable of referring correctly.

Proper matching of word or sentence to a real-world entity, state or event.
Classical Theory *Principles*

**Example**

A bird may be defined as elements with the features [+feathers], [+beak] and [+ability to fly]

Cognitive shift in Terminology

term

specialized knowledge unit
access point to more complex knowledge structures

[Faber, 2009, p. 108]
“Terms mark the tip of the iceberg. Beneath the waters stretch the tentacles of a many-splendored conceptual domain, which represents the implicit knowledge underlying the information in the text.”

[Faber, 2009, p. 108]
Knowledge of specialized language does not consist of a series of watertight compartments. Terminological units and their correspondences possess both paradigmatic and syntagmatic structure. Terms not only represent specialized concepts, but also have syntax and collocational patterns within general language. [Faber, 2009, p. 108]
Implications for specialised translation:

Terminological knowledge units, when inserted in an appropriate (or inappropriate) context, create ripples that affect the text at all levels.
Radical departure from classical *necessary and sufficient conditions* [Aristotelian logic]

Eleanor Rosch *Natural Categories* (1973)

Cognitivist epistemology
“Was bist du für ein Vogel, wenn du nicht fliegen kannst”, sagte der kleine Vogel zur Ente. “Was bist du für ein Vogel, wenn du nicht schwimmen kannst”, sagt die Ente und tauchte unter
(*Peter und der Wolf*)

People create categories of things and assign the same name (or label) to things that are not exactly the same but similar.
Categorization is to be understood as a similarity comparison process
Not defined by necessary or sufficient conditions

Graded membership
Fuzzy boundaries: some categories are blurred at the edges
Similarity is recognized as being highly relative and context-dependent (usage-based, communicative situation)
Graded membership
Some members are more central than others

Family resemblance [Wittgenstein]
Prototype categories are constructed on the basis of experientially perceived similarities among members, and these similarities may involve one or more dimensions, or characteristics
Example

A robin is more prototypical of a bird than a penguin. This leads to a graded notion of categories.

George Lakoff (Women, Fire and Dangerous Things, 1987)
Terms

Unambiguous (no polysemy, no synonymy)
Stricto sensu within LSP
Concepts are assigned a place in a logically or ontologically structured concept system
Standardized
Harmonization & Standardization

**harmonization**

**terminological harmonization**
process by which terminological differences between standards are made compatible or at least interoperable

**standardization**

**terminological standardization**
the selection, approval and dissemination of one or more terms by a standardizing body, after careful study of detailed terminological research findings, for the purpose of promoting preferred usage
Terminology in *ISO Standards*

Definitions

Superordinate concept and **necessary** and **sufficient** delimiting characteristics which delimit the concept from related concepts (excluding encyclopaedic information)

Superordinate concept and **necessary** and **sufficient** delimiting characteristics which delimit the concept from related concepts (excluding encyclopaedic information)
Logical or ontological language-independent understanding of the concept is possible before labelling the concept (onomasiological approach)

(Vienna School: Eugen Wüster 1898-1977)

*The Machine Tool, an Interlingual Dictionary of Basic Concepts*
Definition of concepts *sensu tricto* for entity type clear cut categories

Definitions including more encyclopaedic information work well with *fuzzy* categories

*game*

*murder*
Prototype Theory *Terminology*

**Concepts** > prototypically structured units of understanding referred to as *Categories*

**Definitions** > Templates for meaning description

(Cognitive Linguistics > Frame Semantics: Lakoff, Fauconnier)

Examples: *blotting* & *biotechnology*
Prototype Theory *Functional Advantages*

Umbrella categories (*microbiology, biochemistry*)
- historical information on the development of a discipline is useful for the understanding of umbrella categories

Activities (*cloning, gene splicing*)
- steps on how to perform an activity are essential for categories in life science
Prototype categories:
Offer maximum information with the least cognitive effort (Rosch): 
*linguistic economy*

Maintain themselves to *changing circumstances* and new expressive needs (Geeraerts, 1988)

Able to accommodate the *brute* and *institutional* facts
(Searle 1969)

*Usage-based approach* to language categorisation
Prototype Theory *Problems and Limitations*

Prototypical categorization works best for quick & unreflective judgments

If more reflective judgments are needed, people go beyond the outcome of a similarity comparison.

Keil 1989, Gelman 2003
Concepts which do not have a prototype structure

chair which has been purchased on a Wednesday
31st Century invention

(Fodor & Lepore 1994, Fodor 1998, Giannakopolou)
Prototype structures are problematic and unable to accurately account for word meanings

Prototypicality: ‘gist’ of human categorisation
How to handle encyclopaedic information? (use, legal situation, communicative situation, science development)

Univocity = wishful thinking?
Monosemic reference between terms and concepts

Does not account for terminological variation
Syntactical behaviour of terms not analysed
Exclusively synchronic approach
Frame-based Terminology
Standards of Terminology Work

ISO 704: *Terminology work - Principles and methods*

ISO 1087-1: *Terminology work - Vocabulary - Theory and application (Part 1)*

ISO 24156-1: *Graphic notations for concept modeling in terminology work and its relationship with UML -- Part 1: Guidelines for using UML in terminology work*

ISO 12620: *Computer applications in terminology - Data categories*

ISO 10241: *International terminology standards - Preparation and layout*
What is an LSP?

special language
language for special purposes

language used in a subject field and characterized by the use of specific linguistic means of expression

ISO 1087-1:2000
Experts use linguistic (lexical, morphological, syntactic) means that are characteristic of the subject field concerned and together constitute its LSP.

The selection of these linguistic means, which are largely provided by LGP (language for general purposes), is determined by the prerequisites for optimum understanding between experts:

- precision
- conciseness
- clearness
- suitability for the formation of compounds
**designation**

representation of a concept by linguistic or non-linguistic means

ISO/DIS 704
term

linguistic unit which conveys conceptual meaning within the framework of specialized knowledge texts

[Faber, 2009, p. 109]
Designations may also be symbols, formulas, codes, etc.

**Designation**

a linguistic or other symbol which represents a concept

[GLOSSARY OF TERMS USED IN TERMINOLOGY]
The semiotic triangle first was popularized by Ogden and Richards in their 1923 publication *The Meaning of Meaning*. 

Ogden-Richards’ Triangle

- **Thought or Reference**
- **Symbol**
- **Referent**

- **Correct**: Symbolizes (a causal relation)
- **Adequate**: Refers to (other causal relations)

- Stands for (an implied relation)
- TRUE
Designations

symbol
designation of a concept by letters, numbers, pictograms or a combination of these

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

appellation
name
verbal designation of an individual concept a unique object
concept
unit of thought constituted by a unique set of necessary characteristics

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 (NEN-ISO 1087: 3)
concept

a mental representation of objects within a specialized context or field

ISO 704: 2008
object
anything perceivable or conceivable

NOTE

Objects may be
- material (e.g. an engine, a sheet of paper, a diamond)
- immaterial (e.g. conversion ratio, a project plan)
- imagined (e.g. a unicorn) (NEN-ISO 1087: 3)
Properties & Characteristics

**property**
a quality or feature of an object

**characteristic**
unit of thought that corresponds to properties that are common to a set of objects
object \rightarrow \text{is abstracted into} \rightarrow \text{concept} \\
\downarrow \text{has} \\
property \rightarrow \text{is abstracted into} \rightarrow \text{characteristic}
Characteristics play an important part in terminology work

Define a concept
Delimit a concept
Determine the position of a concept in a concept system
<table>
<thead>
<tr>
<th>Properties of Object 1</th>
<th>Properties of Object 2</th>
<th>Properties of Object 3</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>ivory-coloured;</td>
<td>blue</td>
<td>black</td>
<td>having colour</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NOTE: This characteristic is inherited from a superordinate concept at a very high level, e.g. 'physical object'</td>
</tr>
<tr>
<td>hand-manoeuvred along a firm, flat surface</td>
<td>hand-manoeuvred along a firm, flat surface</td>
<td>hand-manoeuvred along a firm, flat surface</td>
<td>being hand-manoeuvred along a firm, flat surface</td>
</tr>
<tr>
<td>has a ball on its underside</td>
<td>has a ball on its underside</td>
<td>has a ball on its underside</td>
<td>having a ball on its underside</td>
</tr>
<tr>
<td>has three buttons</td>
<td>has two buttons</td>
<td>has three buttons</td>
<td>having at least one button</td>
</tr>
<tr>
<td>has a wire for connecting to a computer</td>
<td>has a wire for connecting to a computer</td>
<td>has a wire for connecting to a computer</td>
<td>having a wire for connecting to a computer</td>
</tr>
<tr>
<td>rollers detect the movement of the ball</td>
<td>sensor detects the movement of the ball</td>
<td>rollers detect the movement of the ball</td>
<td>having a means of detecting ball-movement</td>
</tr>
</tbody>
</table>
necessary characteristic
characteristic that is always true of each object in the extension of a given concept

sufficient characteristic
characteristic that is one of a set of characteristics that determines whether a specific object belongs in the extension of a given concept
**essential characteristic**
characteristic that is one of a set characteristics that are both necessary and sufficient to determine the extension of a concept

**delimiting characteristic**
necessary characteristic that distinguishes a concept from related concepts within one concept system
intension
set of necessary characteristics

extension
totality of objects to which a concept corresponds
Concepts do not exist as isolated units of thought but always in relation to each other in a certain subject field.

**subject field**
field within which the concept field is established

**concept field**
field of thematically related but unstructured concepts
Concept Relations

E.g.: Trawlers within the concept field of fishing vessels (part of the subject field of vessels)

Fishing vessels other than trawlers are not part of this concept field
The terminology of a subject/concept field is not an arbitrary collection of terms but the collection of designations attributed to concepts making up the knowledge structure of the field.

**concept system**

set of concepts structured according to the relations among them
generic concept system
a concept system in which all the concepts relate to each other as generic and specific concepts

partitive concept system
concept system in which all the concepts relate to each other as wholes and their parts
associative concept system
a concept system in which all the concepts relate to each other by association

mixed concept system
a system constructed using a combination of concept relations
hierarchical relation

generic relation

partitive relation

non-hierarchical relation

associative relation
Concepts are organized into levels of superordinate and subordinate concepts.

There must be at least one subordinate concept below a superordinate concept.

Subordinate concepts at the same level and having the same criterion of subdivision are called coordinate concepts.
**superordinate concept**

concept that has one or more subordinate concepts within one particular concept system

**subordinate concept**

concept in one concept system that can be grouped together with at least one coordinate concept into a superordinate concept

**coordinate concept**

subordinate concept having the same nearest superordinate concept and same criterion of subdivision as some other concept in a given concept system
UML > ISO 24156-1 Concept relations

superordinate concept

subordinate concept

subordinate concept
UML > ISO 24156-1 Generic relation
pointing device

- concreteness\(^a\): a device
- controls movement of the cursor or pointer on a display screen

... touch pad light pen ...

computer mouse

- type of pointing device
- has at least one button
- rolls on a hard, flat surface

mechanical mouse

- type of mouse
- rollers (mechanical sensors) detect ball movement
- ball movement moves pointer on the display screen

optomechanical mouse

- type of mouse
- rollers & light sensors detect ball movement
- ball movement moves pointer on the display screen

optical mouse

- type of mouse
- light (more recently light emitting diodes) used to detect mouse movement

\(^a\) concreteness is part of the intension of the superordinate concept above but is listed here as a reminder that pointing devices are concrete objects.

'mechanical mouse' is merely a type of 'computer mouse', which in turn is merely a type of 'pointing device'. Since the set of all mechanical mice is a subset of all mice, the intension (set of characteristics) of the generic concept 'mouse' is included in the intension of the specific concept 'mechanical mouse', hence the characteristic type of mouse. Accordingly, the intension of 'computer mouse' is smaller than that of 'mechanical mouse' while the extension of 'computer mouse' (the number of objects) is larger.
UML > ISO 24156-1 Partitive relation

comprehensive concept

partitive concept

partitive concept
UML > ISO 24156-1 Associative relation
Creation of concept systems

- concept field
- designation
- concept relations
- intension
- extension
- users
- definitions
Definition

Representation of a concept by a descriptive statement which serves to *differentiate it from related concepts*

The unique combination of characteristics creating the intension shall identify the concept and differentiate it from other concepts.
Definition which describes the intension of a concept by stating the generic concept and the delimiting characteristics

*Note:* Intensional definitions shall indicate the *generic concept*, either immediately above or at a higher level, followed by the characteristic(s) that distinguish the concept from other concepts.
Intensional Definition

A definition that is based on a *generic relation* mentions the *generic concept* + the *delimiting* characteristics that differentiate the concept [definiendum] from its coordinate concepts within a *generic concept system*.
**mechanical mouse**

A *computer mouse* with a ball on its underside which activates rollers that detect the ball’s motion and translates that motion into signals that control the pointer on the computer screen.

**NOTE** A mechanical mouse may include a mouse wheel.

The definition of ‘mechanical mouse’ is based on the generic concept system in example 8:

Superordinate concepts: computer mouse and pointing device

Essential and delimiting characteristics:

- has a ball located on the underside of the computer mouse
- rollers (mechanical sensors) detect ball movement
- ball movement is used to control the pointer
Partitive Definition

A definition based on a partitive relation describes a concept as a part of a whole (comprehensive concept)

It is therefore necessary to analyse the comprehensive concept first to determine its position in a concept system and to indicate its relation to the partitive concepts

Partitive definitions typically begin with formulations that clearly indicate the partitive relation such as: *a part of, a component of, a section of, a period of, an element in, ingredients making up*, etc.
encoding disk

the wheel-like part of an x-axis or y-axis roller in a mechanical or optomechanical mouse whose slot rotation creates pulses used to control the direction of the pointer on a computer screen

The definition of ‘encoding disk’ is based on the partitive concept system in example 12:

Superordinate concepts: roller and mechanical or optomechanical mouse

Essential and delimiting characteristics:

— wheel with slots;
— the slots in the disk break the beam of light into pulses
— the pulsing is translated into signals that control the pointer on the computer screen
Extensional Definition

Description of a concept by enumerating all of its subordinate concepts under one criterion of subdivision

Family 18 in the Periodic Table
helium, neon, argon, crypton, xenon and radon [partitive relation]

noble gas
helium, neon, argon, crypton, xenon or radon [generic relation]
Ostensive Definition
Definition Writing: **Criteria**

Concise statement
- States the superordinate concept
- Reflects the concept system describing the concept
- Re-use of already defined terms
Most frequent definition structure:

Subject \((designation)\) + attributive verb \((=)\) + predicate \((definition)\)

ISO 10241, attributive verb = :, -, or \text{een new line}
A definition describes *one concept*, not the words that form the designation

* conifer: tree that bears cones

😊 conifer
tree that is evergreen, has needle or scale like foliage and cone like fruit
Determine the *relations* between the concepts [definiendum and related concepts]

Model a *concept system* within which the concept is situated
If a definition already exists, in an International Standard for example, it needs to be adopted as it stands only if the information in the definition is consistent with that of the other concepts in the concept system thereby allowing the concept in question to be incorporated into the concept system.
Use basic concepts already defined in general language dictionaries or concepts defined elsewhere in the document as far as possible

State the superordinate concept to which the designation belongs and its delimiting characteristics

Determine which concepts are so basic and familiar that they need not be defined
The extension and the characteristics need to fit in one particular concept system.

Concepts differ between different concept systems: legal and technical areas.
Deficient Definitions: *Circular Definition*

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*

- *virgin forest*
  - a forest constituted of a *natural tree stand*
- *natural tree stand*
  - a stand of trees grown in a *virgin forest*

The substitution of the term ‘virgin forest’ in the definition of ‘natural tree stand’ results in:

- *substitution*
  - a stand of trees grown in *a forest constituted of a natural tree stand*
- *corrected definition*
  - a stand of trees grown without interference by man

Once the definition of ‘natural tree stand’ has been modified to remove the circularity, the definition of ‘virgin forest’ can remain as it is.
Circularity within a definition occurs when the designation is repeated to introduce the definition.

**circular definition**

corrected definition

*tree height*

measured from the ground surface to the top of a tree

the distance between the ground surface and the top of a tree
Circularity within a definition occurs when an element of the designation is used as a characteristic.
Deficient Definitions: *Inaccurate Definition*

A definition describes the content of the concept precisely: it shall be neither too narrow nor too broad.

A definition is considered **too broad** if the characteristics selected to describe the concept allow for objects that should not be part of the extension.

A definition is considered **too narrow** if the characteristics selected exclude objects that should be part of the extension.
**too broad**

A pointing device that uses a ball to control the pointer on the computer screen.

By not specifying precisely the mechanical rollers and the ball's location on the underside, this definition expands the extension to include all types of track-balls and optomechanical mice.

**too narrow**

A pointing device composed of a mouse button, rubber ball, circuit board, cord, x- and y-axis rollers, LED infra-red emitter and infra-red sensor.

By specifying a rubber ball and a LED infra-red emitter, this definition limits the extension by excluding older mice that used metal balls and those which use non-LED infra-red emitters.

**corrected definition**

A pointing device composed of a mouse button, ball, circuit board, cord, x- and y-axis rollers, infra-red emitter and infra-red sensor.
A definition shall describe what a concept is, not what it is not.

However, when the absence or non-existence of a characteristic is essential to the understanding of a concept (often signalled by a negation in the designation), a negative definition may be required.
6.3.4 Defining contexts

A defining context is a textual citation where the designation appears in the text and allows one to deduce the concept by implication. Since the context is a cited text, the source of the citation shall accompany the text in order to respect copyright. The source should be authoritative so as to lend credibility to the concept description.

EXAMPLE 48

All the following examples include the source from where the citation has been taken.

mouse

computer mouse
Every day of your computing life, you reach out for your mouse whenever you want to move your cursor or activate something. Your mouse senses your motion and your clicks and sends them to the computer so it can respond appropriately. [HowStuffWorks. How Computer Mice Work. May 2004 http://www.howstuffworks.com/lbs/des/mouse.htm]

portfolio
A portfolio is a purposeful collection of student work that exhibits the student’s efforts, progress and achievements in one or more areas. [What Makes a Portfolio? Educational Leadership. Vol. 48, no.5, 1991]

ad view
In Web advertising, the term impression is sometimes used as a synonym for view, as in ad view. Online publishers offer and their customers buy advertising measured in terms of ad views or impressions. Since a single Web page can contain multiple ads (depending on its design), a site usually registers more ad views per unit of time than Web pages per unit of time. [TechTarget. What is?com. August 12, 2003. <http://whatis.techtarget.com/definition/0,sid9_gci212334,00.html> ]
Definition Rewriting Exercise

Fisheries and Aquaculture Department

Fishing Vessel Types
Trawlers

Characteristics

Deck Type: Normally decked vessels but may, in small scale fisheries include large undecked canoes.

Overview: Depending on the area of operation and trawl used, trawlers range in size from open boats, undecked, powered by outboard engines up to large freezer trawlers and factory trawlers which can fish in the most distant waters. Trawling is the most important and one of the most efficient fishing methods in the world. Today, commercial trawling is carried out from very shallow waters up to a depth of 2000 m. These deep water vessels are provided with engines of sufficient power to tow the gear at the appropriate trawling speed.

Vessel Glass

- Length all (LOA)
- Power all
- Tonnage all (GRT in register tone)

Additional Information: This parent classification includes all vessels operating in an active manner involving towing one or more nets classified as trawls.

Deck Arrangement: From the point of view of deck arrangement, three main types of trawlers can be distinguished: the side trawler (Fig. 1), the stern trawler (Fig. 2) and the outrigger trawler (Fig. 3).
1. **What** is terminology standardisation?

2. **Why** is it important?

3. **Who** standardizes terminology?

4. **How** is standardisation done?
ISO standards are developed…

By subject matter experts in working groups

Through discussions, negotiations, disagreements and agreements

In cooperation and through consensus

Not all member countries have to be represented in a working group, but they are all entitled to be represented.

SMEs (Subject Matter Experts) have to be nominated by a national standardisation body or a liaison organisation.

Thus, everyone can participate in the creation of standards.
Terminological principles and methods are standardized by ISO/TC 37

“Terminology and other language and content resources”.

TC37 has 5 subcommittees:

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<td>Language resource management</td>
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<td>TC 37/SC 5</td>
<td>Translation, interpreting and related technology</td>
</tr>
</tbody>
</table>
Parameters to be considered when starting a translation project

Lexicographical production and marketing - Concepts and vocabulary

Interpreting/interpretation processes

Systems to manage terminology, knowledge and content

Language resource management - word segmentation of written texts for monolingual and multilingual information processing

Complete list at:
TC 37 Terminology Coordination Group
## TC 37 Structure

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</thead>
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</tbody>
</table>
TC 37 i-Term

TC37
ISO 10241-1

Terminological entries in standards—Part 1: General requirements and examples of presentation

Requirements for the preparation, drafting and structuring of terminological entries in standards

Exemplified by terminological entries in ISO and IEC documents
ISO CD10241-2

Terminological entries in standards—Part 2: Adoption of standardized terminological entries

Analyses requirements
Establishes guidelines for the adoption of international terminology standards

By translation into local terminology standards in cross-cultural and multilingual environments
ISO 704

Terminology work—Principles and methods

Basic principles and methods for terminology work
- Relationship between objects, concepts and designations
- General rules governing the formation of terms and appellations
- Definition writing principles

For terminology work in standards institutions and in industry

Appropriate for scientific, technological, industrial, administrative and other fields of knowledge
ISO 1087-1

Terminology work—Vocabulary Part 1: Theory and application

Establishes a basic vocabulary for the theory and application of terminology work.
It does not embrace the vocabulary dealing with computer applications in terminology work which is covered by ISO 1087-2.
Graphic notations for concept modeling in terminology work and its relationship with UML — Part 1: Guidelines for using UML and mind-mapping notation in terminology work

This International Standard describes the application of UML symbols by creating a user-defined UML profile for presenting the results of concept analysis.

This UML profile re-uses UML symbols to represent the terminological principles of ISO 1087-1 and ISO 704. This is not meant to become a replacement for traditional concept diagrams, but should be considered as an alternative and supplementary notation.
This International Standard is meant to promote the use of concept analysis when developing concept diagrams or concept models, information models and data models
Conclusion

Standards are developed in cooperation and upon consensus.

Standards are generally voluntary and become mandatory only when incorporated into national regulations or legislation.

In the field of terminology, both technical and terminology standards are important.

Standards foster participation and thus serve diversity by increasing interoperability of different systems.
Data categories

• ISO 12620
• http://www.ttt.org/clisframe/datcats10.html

• TBX [ISO 30042]
• http://www.gala-global.org/oscarStandards/tbx/tbx_oscar.pdf
## References:

### SC01 Principles and methods
- 1087-1 Terminology work -- Vocabulary -- Part 1: Theory and application
- 704 Terminology work -- Principles and methods
- 860 Terminology work -- Harmonization of concepts and terms
- TR 22134 Practical guidelines for socioterminology
- DIS 24156 Guidelines for using UML notation in terminology work
- 29383 Terminology policies -- Development and implementation

### SC02 Terminographical and lexicographical working methods
- 639 (1-6) Codes for the representation of names of languages
- 12199 Alphabetical ordering of multilingual terminological and lexicographical data represented in the Latin alphabet
- 1951 Presentation/representation of entries in dictionaries -- Requirements, recommendations and information
- 13611 Interpreting - Community Interpreting
- 12615 Bibliographic references and source identifiers for terminology work
- 12616 Translation-oriented terminography
- 22128 Terminology products and services -- Overview and guidance
- 23185 Assessment and benchmarking of terminological resources -- General concepts, principles and requirements
- 10241-1 Terminological entries in standards -- Part 1: General requirements and examples of presentation
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**SC03 Systems to manage terminology, knowledge and content**

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**SC05 Translation, interpreting and related technology**

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