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**SIST-TP CEN/TR 15212:2006**

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**Zdravstvena informatika - Slovar - Postopek vzdrževanja za spletno bazo izrazov in pojmov**

Health informatics - Vocabulary - Maintenance procedure for a web-based terms and concepts database

Medizinische Informatik - Vokabular - Verfahren zur Pflege von webbasierten Datenbanken für Benennungen und Begriffe

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Informatique de santé - Vocabulaire Informatique Médical - Procédure de maintenance

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English Version

## Health informatics - Vocabulary - Maintenance procedure for a web-based terms and concepts database

Informatique de santé - Vocabulaire Informatique Médical -  
Procédure de maintenance

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von webbasierten Datenbanken für Benennungen und  
Begriffe

This Technical Report was approved by CEN on 8 August 2005. It has been drawn up by the Technical Committee CEN/TC 251.

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## Foreword

This Technical Report (CEN/TR 15212:2006) has been prepared by Technical Committee CEN/TC 251 "Health Informatics", the secretariat of which is held by NEN.

This document supersedes ENV 12017:1997.

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## Introduction

The need for a coherent and precise terminology in health informatics is obvious. The overall problem of supplying concept systems and reference terminologies with international scope for all of healthcare information is gigantic but is approached by different organisations and strategies where formal standardization aims for a facilitating role.

This document addresses the much more limited problem of the terminology of informatics and in particular the terminology used in health informatics standards. Vocabulary harmonisation across standards in the field is an important quality requirement and with the growing complexity of health informatics, easy to use tools are needed to manage this. We have to accept that in some aspects terminology and definitions of the associated concepts are developing over time. It is therefore important for the vocabulary to be continuously updated with new terms and unambiguous definitions with references to the normative documents where they are approved.

In ENV 12017 a procedure was described in which a published standard would regularly be issued with the most recent terminology. Given the fast development and requirement for easy access, CEN/TC 251 decided in March 2000 to instead target a freely available database with web access, which would present the terms and definitions of the CEN/TC 251 standards. The intended capacity to present concept models graphically when available, together with the traditional verbal definitions, makes it extra valuable.

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## 1 Scope

This document describes the general requirements on a terms and concepts database. This document also proposes a maintenance procedure for CEN/TC 251, the content, structure and user interface to a web-based terms- and concepts database that will compile the defined concepts with their preferred terms and definitions from the standards developed by CEN/TC 251. These are terms from the health informatics field and not all terms and concepts used in healthcare.

It also describes an example of an implementation and ends with a proposal for CEN/TC 251 for the establishment and maintenance of such a terms and concepts database.

## 2 Abbreviations

T&C    Terms and concepts

## 3 Strategy for defining a Terms and Concepts database

Definitions of concepts reached by graphic modelling are in some situations preferable to text-only definitions. By concept modelling, the relation to other concepts can become clearer and possible overlaps and circular definitions become overt. In many CEN/TC 251 standards, graphic models are used to define concepts, especially when full information models are presented but there are also many concepts in the existing standards that are defined with verbal definitions only. CEN/TC 251 should seek to develop concept models in the future work.

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The database should therefore have the capacity to present the definitions both verbally and graphically.

This document starts with an introduction to graphic modelling where general requirements on different types of models are described.

However, terms as identifiers of concepts are of course also essential. By mapping preferred terms and synonyms to concepts defined by their links to surrounding concepts, it is possible to create a dictionary. The synonyms can also be national terms. In the multilingual Europe this would be of special interest. The database can also hold synonyms intended for technical use in ICT-systems such as XML-tags in addition to terms intended for human reading.

If the field of usage of a term mapped to a certain concept is specified, it is possible to use the same term in some other specified context mapped to another concept. If implemented in the database, handling of homonyms and versions is made possible. By indicating the status and source for terms and concepts, inclusion of normative information from other standardisation bodies than CEN is made possible.

The intended content of terms and concepts will be collected from existing normative documents with reference to its source and domain.

A meta-model for the relations in between terms and concepts and the usage and source of terms is presented in Annex B.

Functional demands on a web-based, graphical terms- and concepts database has been described by STG (Swedish General Standards Group) within SIS – Swedish Standards

Institute in relation to its work on geographical information systems. This work is presented in Annex A.

An investigation and enquiry was made during this project on available tools that met these requirements. The result of this is presented below under Clause 4.11 Available tools.

Finally, essential aspects of the maintenance procedure required are presented. Please note that the important issue of resources for such work is outside the scope of this document.

## **4 General requirements on a language for notation of concept models**

### **4.1 Different models have different purposes**

To be able to understand and interpret a model, it is necessary to know for what purpose the model is made and what it describes. It is important to distinguish between concept models and data models, since they describe two separate phenomena.

### **4.2 Concept models**

Concept models describe the language (terms and concepts) that is used when people communicate within and about a certain activity. The purpose with a concept model is to explain the meaning of a concept that is to be denominated by a certain term.

### **4.3 Information models**

Information models are different collections of models used in connection to production of information systems. They depict the information to be handled in the information system. The purpose of an information model is to show how the information to be handled is structured and processed.

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Concept modelling is a prerequisite for making a correct information model, since the information model is described by terms; and if they are not unambiguously defined by concept modelling, we don't know exactly what we are describing.

The relations in between concept-, process- and information models are illustrated in Figure 1.

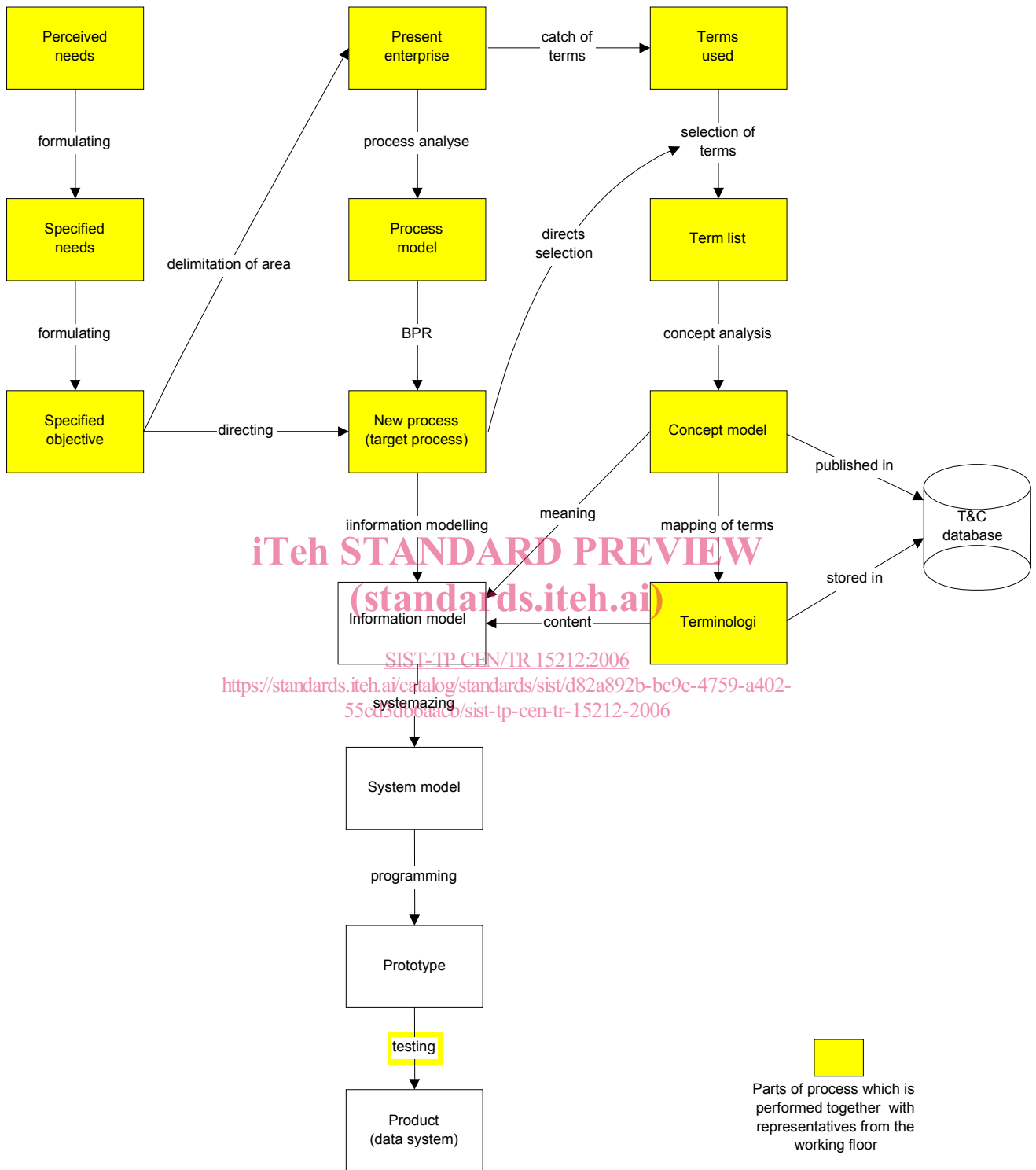
### **4.4 Languages for modelling**

The structure of natural languages people are using in between themselves differ a lot from the structure of data to be handled automatically. Modelling languages intended for concept modelling offer simple descriptions of the linguistic constructions people use. But since natural language constructions can not simply be implemented in an information system, information and data modelling languages are not primarily intended for simple depiction of these linguistic constructions.

A language for concept modelling should be as simple as possible to learn for a person not used to read models, since concept modelling is mostly involving skilled professionals from the floor with no previous experience in modelling. It should preferably contain as few components as possible, and a restricted amount of syntax.

A language for information modelling is on the contrary intended to be used and read by system professionals, needing a rich and more complicated syntax. UML – Unified Modelling Language is the de facto standard for this purpose used in CEN/TC 251 standards. A restricted set of UML syntax can be used for concept modelling but in some examples of concept models other syntaxes are used, as shown in the examples in Annex D.





**Figure 1 — Working process for development of enterprise supporting datasystems**  
 (for explanatory comments, see Annex C)

#### **4.5 Semantic meta model**

There is a need for a semantic meta model that defines the relations in between terms and concepts, the usage of terms, and how concepts relate to each other, thus defining their meaning.

Predefined types of relations combined with a set of cardinalities enables dynamic link creation, and solves the previous problems with vast number of links in other term systems.

In real life the same term often applies to different concepts (homonyms) depending on the context. It is important that the model offers a method to circumscribe the usage of terms in a relevant manner. In healthcare this could be the specialty and/or professional group using the term. Or it could be a local application, or a period of time.

In Annex B a semantic meta model is presented developed by Sven-Bertil Wallin during the CEN/TC 251 WG II work on a standard for Semantic Links (see working documents WGII/N01-09 and WGII/N01-08).

#### **4.6 Data model**

The data model for the T&C database should be based on the semantic meta model, to be able to handle both terms of different kinds and their use, as well as the concepts and their relations. The data model also must handle the verbal normative definitions from the standards of each concept (possibly in versions), together with a verbal structured definition expression; which will –derived from the graphic modelling one for each concept.

#### **4.7 Graphic interface (standards.itech.ai)**

It is suggested that each concept is presented in one image, containing a textual part to the left and a graphic part to the right. On top of the textual column the recommended term for the concept will be the headline. Accepted synonyms can be listed below the recommended term. Below that, the normative definition of the concept (i.e. the traditional verbal definition) will be presented, with the verbal structured expression underneath. At the bottom clarifying notes and references to related concepts will be added when needed.

The graphic part will be interactive with the textual part and with other concept graphs. This means that when a concept is clicked upon in a graph, it will centre itself in the picture and the relations to surrounding concepts will be drawn. Simultaneously the corresponding text is presented in the left column as described above.

Thus it will be possible to move around in the graphic part, step by step. Together with this, overview graphs of variable magnification will ease the navigation, when chosen.

In Annex D an example is given to illustrate this.

#### **4.8 Expressions for cardinality**

When graphs are transcribed into textual structural definitions it is important to express cardinality in a consistent way. Below is a recommendation for such expressions:

- 1:1        exactly one
- 0:1        may <relation> one
- 1:\*        at least one

0:\*            may <relation> several

It is imperative that cardinality can be bi-directionally depicted in graphs for definition purpose.

#### 4.9 Specialisation

When a concept is specialised into sub concepts it is imperative that the aspect of division is specified in the graph, together with notation of if it is an extensive or non-extensive, overlapping or non-overlapping specialisation, as well as any combination thereof.

#### 4.10 Text formatting conventions

Concepts should be written in bold and relations should be written in italics. Specialisations should be written in Arial, if Times is generally used in the document, otherwise in some other differing font.

#### 4.11 Available tools

The only terms and concept database made known to the working group - compliant to the general functions and demands mentioned above – was developed for the Stockholm County Council- SLL (regional health authority). It exists on the intranet of SLL, and is also available at [www.terms.ks.se](http://www.terms.ks.se). It is based on a commercial, internationally available application tool, suitable for the purpose.

A valuable source for the work of CEN/TC 251 is an Access database run by Dr. B. Hayes as a working tool for a CEN/TC 215 Ad Hoc Group on terminology containing some 915 terms and their verbal definitions, and versions from different documents.

### 5 Proposal for a CEN/TC 251 Terms and Concepts database

#### 5.1 Development tool

It is suggested that the terms and concept database tool used in the Stockholm County Council is further developed to meet the intentions and specification given in this Technical Report.

The development tool is based on repositories that can be approached in different ways, depending on which on top user application module chosen. One of these is an UML module. An application tool for customized solutions is also available, and with this a module for concept modeling compliant to the demands above has been developed. From the repository web pages can be generated by a few keystrokes.

However, at the time of purchasing a tool for CEN/TC 251 a renewed investigation into available solutions is recommended since the field is rapidly developing.

#### 5.2 Implementation

Since the input of terms, concepts and their relations collected from various standard documents requests access to a customized module for this purpose, it is preferable that the T&C-base is installed where support is easily available. The database engine is free to choose from common commercial products.

#### 5.3 Maintenance

The maintenance of the T&C database requires a central management function.