

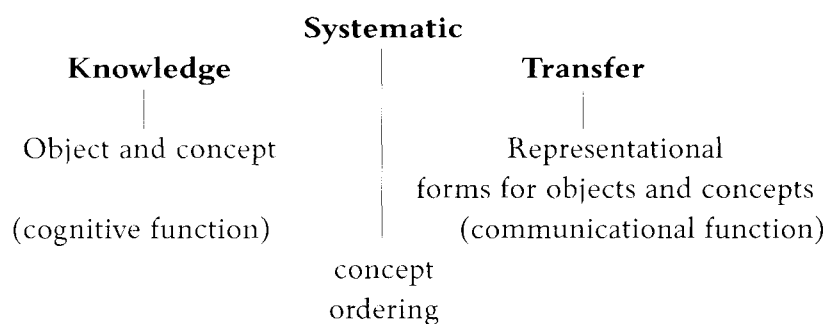
# The seven pillars of terminology

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## 1. INTRODUCTION

Proceeding from the assumption that one of the superordinate aims of terminology is systematic knowledge transfer, we shall find the first three pillars represented by the words 'systematic', 'knowledge' and 'transfer'. This can be illustrated in the following way:

Fig. 1



Although these three pillars are of vital importance and are considered the bearing elements of any terminological endeavour, be it theoretical or applied, a fourth pillar, 'terminological working methods' is still lacking and needs to be added. An important part of the transfer of terminology is: recording and proliferation, neither of which is covered by Figure 1; consequently, we need to provide a fifth pillar – terminography.

The sixth pillar – indispensable for the proliferation of knowledge about terminology – is dedicated to education and training in terminology.

However, the 'edifice' of terminology would be incomplete if we were to disregard the vast sector of development and applications of terminology in the broad context of professional communication. This seventh pillar comprises a series of apparently heterogeneous activities and other issues;

nevertheless, all together they play an important role in, or even render possible, professional communication and knowledge transfer.

In the following, we shall try to go more deeply into the content of the seven pillars.

## 2. OBJECT AND CONCEPT

Right from the beginning of scientific research into terminology, objects and especially concepts were central for the terminological approach which is widely reflected in the terminological literature and not least in the basic terminological standards at national and international level.

Wüster (1959/60 (2001: 22) has defined the object in the following way:

Alles, worauf sich so das Denken eines Menschen richtet oder richten kann, heißt im philosophischen Sprachgebrauch "Gegenstand". Auch Sachverhalte sind Gegenstände in diesem Sinne.

ISO 1087-1:2000 reads:

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) or imagined (e.g. a unicorn).

More detailed information is available in ISO 704:2000:

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, flow ability, 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 deal with objects for the purpose of communication.

A more extended view of the object is presented among others by Budin (1994: 203-208) and Picht (2003: 154-159; 2008: 91-97) where it is argued

that the object should be considered a unit of knowledge. Especially in certain subject fields such as history and archaeology, objects constitute a considerable number of units of knowledge and as such they are of interest to terminology.

Concerning the concept, academic discussion has been much more intensive. Three approaches can be singled out:

The concept as a

- unit of thought (an inappropriate translation of the German ‘Denkeinheit’, because the process of thinking is not rendered in the English translation);
- unit of knowledge;
- unit of cognition.

The following definitions of the **concept as a unit of thought** – among others – have been offered:

Wüster (1979: 7):

Thus the concept is an element in a thinking process.

Der Begriff ist so ein *Denkelement*.

ISO 1087:1990:

A unit of thought constituted through abstraction on the basis of properties common to a set of objects.

It has been argued that the concept as a unit in a thinking process necessarily has to be individually coloured and therefore cannot really be a universal reflection of the accepted opinion of a professional community (see Dahlberg 1985 and Picht 2004). The following definition of the concept as a unit of thinking is offered:

A concept is constituted by the individual ideas and knowledge of the thinker; the constituting chunks of knowledge and ideas have not necessarily been submitted to intersubjective proof and may be erroneous; its life cycle depends on the cognitive changes taking place in the mind of the thinker.

The **concept as a unit of knowledge** has been introduced by Dahlberg (1985: 140). She claims:

The concept is a unit of knowledge which comprises in a linguistic form the provable, necessary predications about a given object.

Begriff ist eine Wissenseinheit, die überprüfbaren, notwendigen Aussagen über einen ausgewählten Gegenstand in einer sprachlichen Form zusammenfasst.

The latest version of ISO 1087-1:2000 reads:

Concept: unit of knowledge created by a unique combination of characteristics.

According to our view, this ISO-definition is rather knowledge-sparse and covers only a part of the information pertinent to the concept to be defined. Therefore, we offer the following definition:

A concept is constituted by all characteristics (chunks of knowledge) inter-subjectively recognised and agreed upon by a professional community at a certain point in time; it has a life cycle determined by cognition dynamics.

In addition to the above definitions the concept can be viewed as a **unit of cognition**. While the concept as a unit of knowledge is more or less stable during its life cycle and the unit of thinking varies according to the thinker and his knowledge at a given point in time, the concept as a unit of cognition is relevant at the moment of conceptual changes as a result of the development of our knowledge. Therefore we propose the following definition:

Concept as a unit of cognition: unit of knowledge, the life cycle of which has finished and therefore will be subject to the modifications of a certain number of characteristics in accordance with cognition dynamics; the result will be a new and independent unit of knowledge.

It is evident that only the concept as a unit of knowledge can be the object of storage in a terminological data bank.

### 3. WAYS OF REPRESENTING OBJECTS AND CONCEPTS

Apart from material objects which can represent themselves by their material appearance, all other types of objects and all concepts need a sign as communicative means of communication. The ISO standard 1087-1:2000 defines 'designation' as follows:

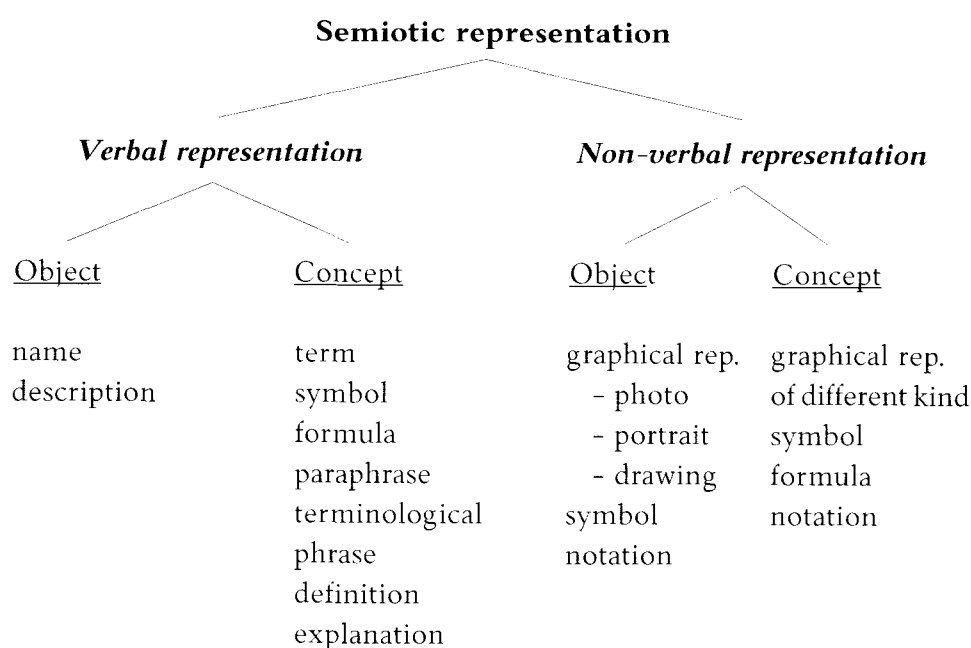
Representation of a concept by a sign which denotes it.

Note: In terminology work three types of designations are distinguished: symbols, appellations (names) and terms.

This definition is not wrong, but too restrictive and contains in addition a contradiction. Firstly, not only concepts are represented by a sign. Secondly, the list of designations in the note is by no means complete and in addition, contains ‘appellations (names)’ which normally denote objects.

Representational forms for objects and concepts are shown in Figure 2.

Fig. 2



In addition, non-verbal representations include signs perceived by sound, smell and taste, e.g. a warning signal when closing the doors of a train, a substance added to gas in order to make it perceivable and methylated spirits, respectively. For further details see Laurén, Myking, Picht (2008: 109f).

It is obvious that the term by far is the most frequent verbal concept representation. However, there are cases, e.g. in architecture, anatomy and several technical disciplines, where a drawing is the predominant way of

representation. A drawing may even be compulsory, for instance when applying for a building permit.

Definitions and explanations are indispensable when the content (the intension) of a concept has to be communicated, clarified or even fixed, e.g. in a standard or strictly controlled language as for instance the communication in air traffic.

Descriptions should be used only for objects. Since persons and events are objects, too, it seems odd to define a person such as Einstein or an event such as the sinking of the Titanic. They can be described and these descriptions will very often contain indications of time and space, which are absent from a definition.

Equally important are terminological phrases (de 'Fachwendung'), e.g. 'to draw a bill'. These constructions are concept representations, too, because the concept may be represented in this way in one language and by a normal term in another; in addition, it can be defined. It is characteristic that the verb cannot be replaced without changing the concept denoted. In addition, when translating these phrases, it cannot be done word-by-word, e.g. English: 'to die intestate' → German: 'ohne Hinterlassung eines Testaments sterben'. These constructions may be characterised as terms *sui generis* and treated as such in a term bank.

Symbols and formulae can appear in verbal and non-verbal representations depending on whether they are used in an oral or written text, e.g. the sign '%' has to be pronounced in a speech or interpretation and a formula such as NaCl can have both representations in an oral text.

Notations can be used for both objects, e.g. in the catalogue of a museum, and for concepts in a classification, e.g. the UDC.

#### 4. SYSTEMATISATION AND KNOWLEDGE ORDERING

The first two pillars provided cognitive and communicational material at concept and object level. It may be compared with atomised knowledge without manifest relations between the entities. In order to reach a higher level of conceptually coherent knowledge, a systematisation or ordering is paramount.

Very early in the historical development of terminology as a field of knowledge, the necessity of ordering concepts was recognised. Schlomann had already elaborated systematically ordered dictionaries in technical subject fields at the beginning of the last century. Wüster, in several works,

established a coherent theoretical framework for conceptual ordering. Concept systematisation is today an indispensable part of terminological science and terminology work.

The basis of any conceptual ordering is the relations which may exist between concepts. Relations may be logical or ontological. The first is based on the similarity of concepts; all subordinate concepts of a superordinate concept contain/inherit the entire intension of the superordinate concept; the specification is added by at least one more characteristic. The subdivision at a certain level is determined by the chosen criteria of subdivision. A system of concepts established on the basis of logical relations only is usually 'closed-ended', meaning that a subdivision ends when no more subordinate concepts are known at a certain point in time.

Ontological relations are of a very different nature. They reflect – in contrast to the logical relations which are based on abstraction – relations perceived in the surrounding, the thought or imagined world. The most frequent relations are: partitive relation (with a strong local bias), sequential relation (with strong time elements), causal relation, transmission relation, genetic relation, interdependence relation and others. Some types of relations are dominant in some subject fields and rarely found in others. The nature of the ontological relations becomes obvious when comparing different ontological relations, e.g. in a transmission relation, elements of sequential relation can be found (the legal steps of the purchase of an estate); the genetic relation often contains causal elements (consider the sequence 'egg – chicken – hen'), etc. It is characteristic of ontological relations that they do not follow the criteria of subdivisions in the logical sense. They have to be established pragmatically in accordance with the aim of structuring, e.g. a concept system ordered according to the partitive relation is theoretically open-ended, because (theoretically) a subdivision of material objects only stops with the parts of an atom.

In order to make a structure more flexible, i.e. combine various relevant aspects in one conceptual system, the system may contain a combination of relations, a so-called mixed system. In this case, the change from one relation to another has to be marked, e.g. by the notation. (Example: 1.2-3 → 2 refers to a subordinate concept of 1 and 3 is a part of 2).

ISO 1087-1:2000 defines concept system:

Set of concepts structured according to the relations among them.

ISO 704:2000 *Terminology work – Principles and methods* as well as Arntz/Picht/Mayer (2009) provide more and more detailed information about concept systems.

A less well-defined way of ordering is by ontology. Various definitions have previously been offered. Some authors consider ontology equal to a concept system, while others include many other aspects of knowledge ordering. Since this field still needs more research and clarification for terminological application, we shall only offer two definitions presented at the *Workshop on Terminology, Concept Modelling and Ontology* in Vaasa, 2006 (EAFT–NordTerm):

Ontology: the philosophical discipline

- Study of what there (possibly) is
- Study of the nature and structure of reality
  - Domain of entities
  - Categories and relations
  - Characterizing properties

Ontology: a theoretical or computational artefact

- “an explicit and formal specification of a conceptualization” (Gruber)
- A specific artefact expressing the intended meaning of a vocabulary in terms of the nature and structure of the entities it refers to.

## 5. TERMINOLOGICAL WORK

ISO 1087-1:2000 defines terminological work as follows:

Work concerned with the systematic collection, description, processing and presentation of concepts and their designations.

This definition gives a first idea of the different tasks; however, it cannot serve as a guideline for the working process proper. Before giving an outline of the general phases of the working process, we have to clarify the concepts semasiological and onomasiological approach. In the first case the term is the centre of consideration, whereas the onomasiological approach focuses on the concept. It has been said that terminology uses an onomasiological working method. That is not quite in accordance with reality, since both methods are employed, depending on the working phase.



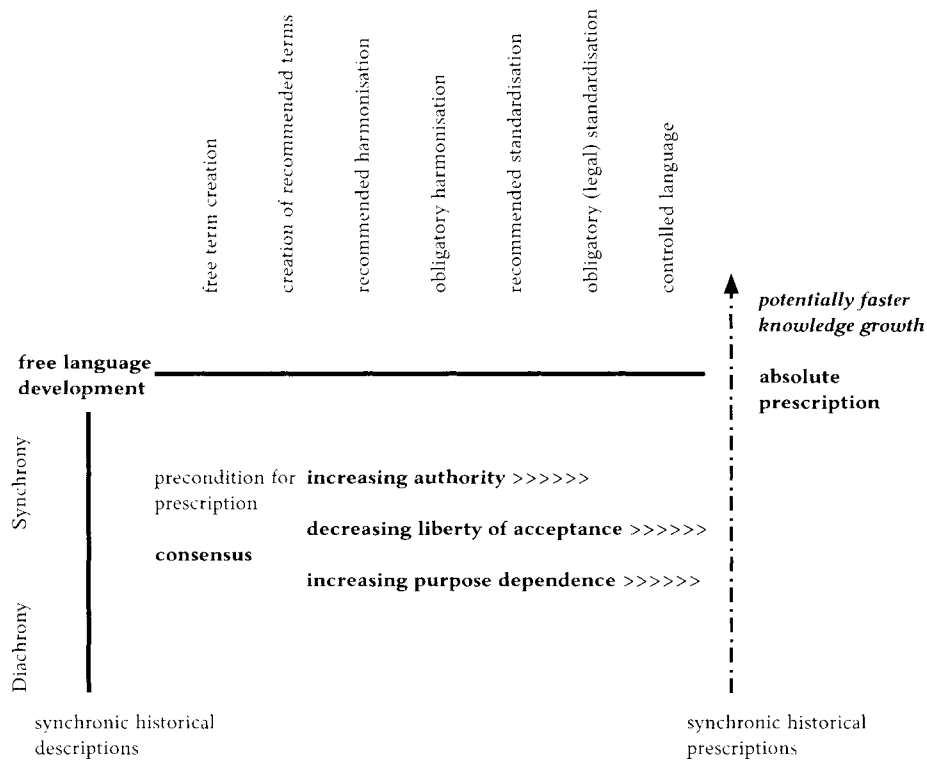
A rough sketch of the different phases could be:

- Election of the subject field or part of it
- Collection and evaluation of the documentation material
- Extraction of term candidates from texts and other pertinent information (semasiological step, because the representational form of a concept is the only indication of the existence of a concept in a context)
- Preliminary systematisation as a hypothetical system of concepts
- Terminological analysis of the concepts, including the verification of the preliminary system of concepts, its completeness and the correct place of the concept within the system (onomasiological step)
- Analysis and elaboration of the representational forms (semasiological step):
  - clarification of synonymy
  - grammatical information for each term
  - register of the term
  - regional use of the term
  - other pertinent information, e.g. selection of illustration
- Formulation of definitions in conformity with the concept system. The system of definitions has to reflect the concept system (onomasiological step)
- Recording of the terminological data. This step forms the point of intersection with terminography.

The above working process reflects descriptive terminology work. Any prescriptive intervention, e.g. standardisation of a terminology, must be based on descriptive terminology work, where the conceptual and representational reality is stated. The data obtained constitute the point of departure for any harmonising or standardising activity.

The range and degree of intervention (here only shown as an example of graduation) can be illustrated by the model in Figure 3. In addition, some sociolinguistic factors are indicated in the centre of the model.

Fig. 3 (Picht 2005: 189-198)



## 6. TERMINOGRAPHY

The basic task of terminography is to present terminological data e.g. in a book or a data base and thus make them available for different kinds of application.

ISO 1087 has defined 'terminography' differently in the last decades. The 1990-version reads:

The recording, processing and presentation of terminological data acquired by terminological research.

Note: 'terminography' replaces the older terms 'terminological lexicography' and 'special lexicography'.

In ISO 1087-1:2000 terminography is defined as

Part of terminological work concerned with the recording and presentation of terminological data.

Note: Terminological data may be presented in the form of term banks, glossaries, thesauri, or other publications.

It is obvious that processing has been transferred to terminological work which seems quite reasonable, since this activity belongs to the elaboration phase and its methods, whereas the recording and presentation resembles to a certain extent the classical lexicographical work and its products. For the relationship between terminography and lexicography see for instance (Laurén, Myking, Picht 1998. chap. 11).

In systematically ordered terminological products, the onomasiological principle is applied which becomes manifest by the fact that one entry contains only ONE concept together with its representational forms and information on the place of the concept in the concept system.

Since today's terminological data banks (TDB) offer a wide range of possibilities with regard to the design of record formats, data categories included in them and the quantity of information recorded, it seems to be pointless to offer examples in this contribution, because a record format depends mainly on the purpose of the TDB. However, three main categories of data can be distinguished:

- Data about the concept and its systematisation
- Data about the representational forms of the concept
- Administrative data concerned with the management of the TDB.

The ISO-standard 12620 *Computer applications in terminology – Data categories* provides valuable information about possible data categories and their definitions/descriptions.

## 7. TRAINING IN TERMINOLOGY

Since terminology today is established as a field of knowledge with scientific research and corresponding applications, it fulfils the requirements of an academic discipline which again can be considered the precondition for courses of studies and training.

In the 60s and 70s, especially in connection with the increasing interest in LSP and the introduction of LSP-studies at some universities, the need for terminological study components became obvious. However, no teaching material was available as yet in Western countries. In the Soviet Union the first text books had already been published in the 50s.

In Western countries, Wüster was the first to offer a coherent course of

theoretical terminology at the University of Vienna in 1972. The manuscript of his lectures was edited by H. Felber and published in 1979 (two years after Wüster's death) under the title *Einführung in die Allgemeine Terminologielehre und Terminologische Lexikographie*. Since the early 80s, an increasing number of textbooks on terminology have been available in several languages.

Since terminology is an important part of LSPs and LSPs again are indispensable for all professional communication, it is only natural that terminology usually became an embedded and integrated study component in LSP translation and interpretation studies and studies in technical writing. Nowadays, terminological study components are part of various types of professional communication studies, which very often include the basics of theoretical terminology and an array of applications and tools (e.g. TDBs, semi-automatic term extraction) together with their integration into more complex systems. For more information see for example Picht (1998: 975-982).

The professional profile of a terminologist has been elaborated and published by Rat für Deutschsprachige Terminologie (RaDT) (2004).

#### 8. THE SEVENTH PILLAR

The seventh pillar consists of applications closely related to terminology or activities which are unthinkable without terminology. Two representatives, localisation and terminology planning, should be mentioned in this article, although issues such as terminology and copyright, terminology and knowledge management, terminology in classifications and thesauri, the historical development of terminology, different theoretical approaches to terminology, terminology and cognition, etc. belong to the seventh pillar. In reality, in order to give a more satisfactory insight into the content of the seventh pillar, at least an extensive article would be necessary.

Localisation of software programmes is today an important application of terminology in order to adapt a programme's language, e.g. English, to other languages and thus make it suited to function in other countries and markets. Localisation is not only a mere translation, but also a cultural adaptation and harmonisation of terms and expressions used in the templates in another language. An excellent insight into localisation is offered by Reineke/Schmitz (Hrsg.) (2005).

Terminology planning as a part of language planning has many different

forms and aims and takes place at different levels. Common to all levels is the deliberate intervention into the existing state of a terminology (corpus planning). A precondition for all language and terminology planning, however, is the existence of a language policy which determines the status planning of a language.

Terminological standardisation at international, regional and national level can be considered one form of terminology planning with the aim of improving professional communication in standardizable subject fields. An example of international prescriptive terminology planning which is absolutely vital is, for instance, the language used in air traffic control. In this case security reasons are central and the question of acceptance by its users is unquestionable.

Terminological harmonisation endeavours carried out by international and/or national enterprises are not necessarily less strict. However, the range of application of a certain terminology is limited to the documents of the enterprise and, possibly, adapted to the kind of professional communication, e.g. communication among experts or communication with customers. Apart from improved communication quality, the terminology of a given enterprise contributes to awareness and acceptance of it.

Another completely different form of terminology planning, usually at national level, is the creation or improvement of terminologies for relevant subject fields in a language which still lacks a given terminology or the existing terminology is underdeveloped and does not serve the purposes of knowledge transfer in the language in question.

Equally important for terminology planning is the awareness of a language community with regard to the increasing or yet too dominant influence of another language on the native one. An example of this awareness is the document *Domänenverlust im Deutschen* (RaDT: 2005). A more theoretically based analysis of the subject 'domain loss' and especially 'domain dynamics' can be found in the article *Sprache, Domäne und Domänedynamik* (Laurén et al. 2004: 5-13).

## 9. CONCLUSION

The aim of this overview has been to give an idea of the components in the field of terminology and to make the interdependence between them visible. Among the first five pillars the interconnection is perhaps most obvious, since the omission of one component renders any reasonable

terminological work or research difficult or even impossible, since the components are so strongly intertwined. The sixth pillar provides the basis for the formation of sufficient manpower in order to maintain and further terminological work and theoretical research. Although the seventh pillar covers rather different issues, nonetheless they are all closely related and relevant to terminology and often even dependent on the contribution of terminology work and research.

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#### SEPTYNI TERMINOLOGIJOS RAMSČIAI

Pirmasis šio straipsnio tikslas – apžvelgti pagrindines žiniijos sritis, kurias apima terminologija kaip teorinė ir taikomoji mokslinė disciplina. Nagrinėjamos sąvokos ir objektai, sąvokų ir objektų vaizdavimo formos, sąvokų tvarkymas ir klasifikavimas, terminologijos darbo metodologija, terminografija, terminologijos mokymas ir plati terminologijos taikymo sritis. Antrasis, dar svarbesnis straipsnio tikslas – išryškinti šių sričių ryšius, sąveiką ir tarpusavio priklausomybę.

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