

Systematic Aspects of Terminology

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Article abstract

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SYSTEMATIC ASPECTS OF TERMINOLOGY

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Résumé

Les auteurs se penchent sur l'activité terminologique au Brésil. Afin de nous faire part d'une partie de leurs recherches, ils présentent certains aspects de la théorie générale de la terminologie (le concept de concept et le concept de système conceptuel), après avoir exposé les principes de base de la théorie générale de la terminologie.

Abstract

This article describes terminological research in Brazil. The authors present their own research, covering some aspects of the General Theory of Terminology (GTT) namely the concepts of "concept" and concept system.

1. TERMINOLOGY ACTIVITIES IN BRAZIL

Terminological activities in Brazil are just in their infancy. To this day, no one in the country can call himself or herself a terminologist. Nevertheless, professionals from different subject areas now have an opportunity to share their experiences as members of the Technical Committee for Terminology Standardization, recently created by the Brazilian organization for standardization (ABNT). Until this development, groups used to meet independently within their own professional circles.

Linguists form the majority of researchers, most of whom are devoted to descriptive terminology, while a smaller group, including translators, linguists, classificationists and computer scientists, are interested in prescriptive terminology.

We belong to the latter and, as such, follow the Vienna School of Terminology. Notwithstanding, there are a number of aspects of the General Theory of Terminology (GTT) that we would like to address briefly here in order to help explain our work. They are the concepts of "concept" and "concept system."

Before we present our points of view on these topics, we believe that it is necessary to introduce the basic principles of GTT.

2. OBJECT AND AIM OF TERMINOLOGY

One of the contributions of Wüster (1981: 57), the General Theory of Terminology was to research the basic principles of the development of concept systems within a universe of discourse.¹ His GTT gave rise to the Vienna School of Terminology.

Among the postulates of GTT, there is one that is specially relevant to our study, namely that concepts of a universe of discourse constitute a concept system. In fact, for Wüster (1981: 85) and his followers, concept systems are real classification systems, to which the fields of logic and ontology contribute ordering principles. The foundation of this new field of knowledge should lead to a methodology for terminological work, which is indeed a creative activity. To elucidate relations between concepts is to map out and structure the different universes of discourse. In Wüster's analysis, one observes that the

conceptual content of terms is determined by the universe of discourse and, in turn, it determines this universe. In this perspective, when preparing a terminology, one must first of all be able to apprehend the universe of discourse as a whole, so as to put each constituent concept in its proper place within the concept system; this place, in turn, depends on the concepts that are integrated into it.

GTT opens large research possibilities when it is used to look at an extra-linguistic element — the referent. As a matter of fact, the object of GTT is to establish terminologies in which terms denote the referents of a universe of discourse being their conceptual content fixed by definitions.

Referent is an element already considered by linguists, specially in the field of semantics, which deals with the meanings of words used in everyday language. In semantics, meaning context-dependent; conversely, in terminology, terms have a proper and unique conceptual content and are therefore context-independent. In order to reflect this reality, Riggs (1989: 14) suggests the name of onomantics for this new field of study.

In the sixties, Saussure (1967: 22) demonstrated that meaning does not come from words, arguing that we define things, not terms, and that it is methodologically unsound to start from terms to define things.

But the term is the symbol that we manipulate in organizing terminologies. If it is true that in everyday language the meanings of words are context dependent, in specialized language this cannot occur: each symbol denotes only one concept, and each concept should be designated by only one symbol. Imprecision and ambiguity in science and technology are not admissible, since they hinder scientific development and make accurate communication, technology transfer and commercial trade among nations difficult.

Thus, linguistics is not the only field of knowledge to contribute to the theory of terminology. While this science is a fundamental component of terminological work — since terms are words and word-phrases belonging to natural languages or based in the linguistic patterns of such languages — GTT also draws on related branches of philosophy, such as ontology, logic, gnoseology and conceptology.

Logic and ontology are two fields of study that are thoroughly explored by Wüster, who integrates the General System Theory into his approach: a concept is viewed as a component of a system of concepts, not as an isolated concept. Using the systems approach requires taking a holistic perspective — in this case, the universe of discourse — while at the same time focussing on the relative position of the concept. The positioning of concepts in a system raises numerous questions, such as the correlation of categories of consciousness, knowledge and cognition, and the organization of concepts into concept classes to form a system (classification).

In his study of concepts, Riggs (1979: 592) suggests the adoption of methods used in the study of conceptology.

Relating to philosophy, we find the field of logic, philosophy of science and classification research. In this context there has emerged a subfield that focuses on the analysis of concepts, including their relation to science as theoretically significant units of knowledge, and their relation to empirical observations as judged by “operational” or “denotative” criteria. So far this subfield has not established its autonomy, although its problems are much discussed in the literature of its parent disciplines [...] It is convenient to coin a word, “conceptology,” to be defined as the systematic study of concepts.

As a conceptologist, the terminologist studies a term from the point of view of a concept denoted by the term, but as a linguist (lexicologist) he or she studies the use of terms. For Riggs, the science of terminology falls between conceptology (normative terminology) and lexicology (analytical terminology), thus establishing a link between these

two fields and providing a conceptual, instead of a strictly lexicological (or descriptive), study of terms.

In fact, *“les sens imprécis qui composent les terminologies de formation naturelle ne peuvent servir de base aux terminologies ordonnées conçues pour la communication scientifique. À cette fin, il faut mettre spécialement au point un réseau de sens précis et uniques qui réponde au niveau de développement le plus actuel de la science”* (Kandelaki 1981: 163).

To achieve this requires the development of a specific method that is dependent on the concepts of “concept” and “concept system,” as well as the acceptance of category as an element capable of forming an integrated concept system.

3. CONCEPT

The concept of “concept” is a fundamental aspect of methodological procedures in terminological work.

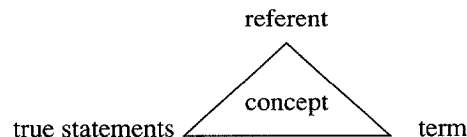
Concept is usually defined as a “unit of thought.” But terminology is concerned with concepts in the environment of science, technology and crafts, where knowledge is the complete set of true statements of reference items in a given field. Therefore, concept is not the mental synthesis of a unique knower, but the mental synthesis of a group (with-in a specialized language) of knowers. In other words, the mental synthesis reflects the objective knowledge of the specialists and technicians of a universe of discourse. Thus, concepts representing this reality have the legitimacy of a given group of specialists.

Any of his statements relating to a reality experience or measured creates a ‘knowledge element’, which may also be regarded as a primitive or a basic concept. And collection of such statements or knowledge elements referring to an object of reality or a verifiable object thought may be termed a knowledge unit.” (Dahlberg 1978: 11-12)

In the case of the mental synthesis of a unique individual, there is no possible way of scientifically verifying the content of each concept. However, for concepts of a field of knowledge, true statements regarding each concept must be scientifically confirmed.

Concept theory, as stated by Dahlberg, introduces the notion of formal categories, which are fundamental for concept systematization.

According to Dahlberg’s referent-oriented analytical concept theory, concept is a triad consisting of an item of reference, true statements on referents and the term. The following triangle graphically represents this triad.



What one defines and systematizes is not the term, but the concept; the term denotes the concept. True statements on the item of reference, which are achieved through analysis of all of its properties, help to describe or identify certain qualities of an item of reference. “Characteristics are the stated properties of objects, of items of reference, but only at the level of the concepts of these objects do they become the characteristics of these concepts.” (Dahlberg 1978: 15)

The universe of discourse determines the selection of characteristics included in the definition. Since these characteristics are concepts, they are also defined. It is this integrated network that constitutes the concept system.

4. CONCEPT SYSTEM

To define and delimit the work of the terminologist, a second concept must be discussed: the concept system. In terms of the preparation of terminologies, we must consider two particular aspects of the concept system: the concept system as a concept itself, and the nature of the content of a concept system.

First of all, the concept of system does not necessarily require the existence of a hierarchy. When considered as such, limits are imposed on terminological work, specially as regards the presentation of systematic terminologies. If one can identify hierarchical relations (within a class) and non-hierarchical relations (between different classes), why would the latter be absent from the system?²

Traditionally, the method of organizing systems of concepts has been limited, in practice, to the organization of classes, and consequently does not provide the basis for gathering classes to form a real system. By that we mean there are no principles by which to relate classes of the same nature into a general classes (or category), or to relate classes of different nature.

Let us now turn to the second aspect of the concept system we wish to discuss in this paper, namely, the nature of its content. Kandelaki (1981: 157) states that we must distinguish between the concept system of the theory of science, the system of meanings of technical terminology and the concept system used in the ordering of terminologies.

The first of these distinguishes between the object, the knowledge of object and the object of knowledge. In this case, we are dealing with theoretical categories of a given science, in other words, a concept system that represents the deepest present state of knowledge. Conversely, a system of meanings is a purely linguistic category, and the concept system used for ordering terminologies is an intermediary system, which Kandelaki also considers to be a linguistic category.

If in the system of concepts of theory "*la monosémie de la notion est l'une des conditions élémentaires d'un raisonnement juste, qu'exige la loi d'identité,*" then the system of meanings of natural formation have certain particular characteristics.

Chacune [des définitions] a été élaborée pour une notion prise à part, indépendamment du contenu des autres notions qui lui sont liées. C'est pourquoi les sens de la terminologie de formation naturelle fixés par elles ont des limites mutuelles imprécises. En outre, on sait qu'un seul et même terme possède souvent plusieurs définitions. Elles reflètent, d'une part, les diverses étapes du développement de la science concernée, l'étalement chronologique de la formation de ses notions. (Kandelaki 1981: 161)

Contrary to applied linguistics, science deals with deep concepts that are related to terms. As such, theory concept systems are also deep concept systems.

We consider the system for ordering concepts to be the safest approach for ensuring the communication process within a specialized language, since this is the main goal of terminological activity; hence the relevance of these questions.

Scientific knowledge may be considered as a system consisting of particular fields of science, which are in turn made up of concepts.

C'est pourquoi en fait l'ordonnance sert à dégager des parties du système, c'est-à-dire du sous-système et du sous-sous-système, mais l'usage veut qu'on parle dans chaque cas de la mise en évidence d'un système indépendant de notions.

La mise en évidence de ce système de notions se fait à partir des sens des termes qui composent les terminologies de formation naturelle et qui sont énumérés dans un glossaire préliminaire.

Dans ce sous-système, ou comme on dit habituellement, ce système de notions des sciences physico-techniques, on distingue les catégories et les rapports logiques entre les notions. (Kandelaki 1981 : 164)

Logical relations are highlighted in hierarchical relations — arranged vertically as well as horizontally — and form concept classes.

5. CATEGORIES

Category is a concept with general application that can be used to group other concepts. According to this definition, category is a certain kind of characteristic that may be stated so as to form an item of reference, possessing a gathering property. This property enables us to systematize knowledge of a certain reality from a global perspective.

Dahlberg (1978: 19-20) describes categories as:

final statements that may be made in the step-by-step construction of predications, that is, by predicating each time again on the contents of a predicate. Let us take the following cases of such step-by-step constructions:

How may a 'weekly newspaper' be categorized?

a weekly newspaper is a newspaper
 a newspaper is a periodically appearing document
 a periodically appearing document is a document
 a document is a carrier of information
 a carrier of information is a carrier
 a carrier is a material object

In this way concepts may be related to their form category. This, however, cannot be done on a universal scale. Such concepts must be grouped first to object and subject areas. The grouping within such an area according to form categories has been called faceting.

Thus, concepts can be related to their respective categories, thereby enabling us to have greater knowledge about them by highlighting their relations with other concepts.

We can see that the categories have a structuring ability: not only do they structure all our knowledge elements and knowledge units, they furnish at the same time thereby the skeleton, the bones and tendons for the structuring of all our knowledge. With their conscious use, then, the body of our knowledge may be kept together, may be moved and may be kept flexible — and may organically grow. (Dahlberg 1981: 34)

According to their research, it would appear that specialists associated with standardization organizations, as well as INFOTERM (International Information Centre for Terminology), do not agree with this understanding of categories. *ISO 704 — Principles and methods of terminology*, for instance, presents a classification of characteristics that excludes categorial relations — but which is, nevertheless, useful for term formation (terms should evoke the item of reference) — using concept alone as the unit of communication. Other documents, widely disseminated by UNESCO (Felber 1984) and INFOTERM (Felber 1989), use the same classification, identifying intrinsic and extrinsic characteristics. This classification does not lead to final statements on an item of reference and, as such, does not lead to concept systems.

The concept of category has not been widely accepted because it would lead to "philosophical systems." Felber (1982: 440) recognizes that characteristics may be classified from either the philosophical point of view (essential and not-essential), or from the pragmatic point of view (intrinsic and extrinsic), but notes that the latter "are more appropriate to science and technology terminology."

Practice, however, has demonstrated that by not introducing category in the systematization of concepts, terminological work does not create concept systems, but only independent classes without any relation between them. In a real system of concepts, categories arrange concepts hierarchically (logical and ontological intra-category relations), as well as underline non-hierarchical relations (inter-category relations). Thus, all concepts belonging to a universe of discourse are somehow related to each other. In fact, "system" is understood as meaning "hierarchical classes" (Wüster 1971).

These are not abstract, but methodological considerations. The organization of classes into categories and the ordering of these categories according to certain criteria will provide the user with a holistic view of the universe of discourse. If we limit the gathering of terms to the selection of characteristics from a pragmatic point of view, we will not achieve such an overall perspective. For the ordering and gathering of classes, the introduction of categories may be seen as a method.

There are, however, at least two different approaches to categorial analysis for the organization/classification of terminologies.

First, we may decide *a priori* on a set of categories that may be employed in any universe of discourse. For example, Kandelaki (1981: 173) proposes a set of nine categories:

- Category of objects
- Category of procedures
- Category of states
- Category of regimes/conditions
- Category of properties
- Category of magnitudes
- Category of units of measure
- Category of sciences and branches of science
- Category of professions and occupations

Concepts belonging to each category are hierarchically arranged, and the categories are in interaction with one another, thus making this a multidimensional system. Indeed, for classificationists this would be a multi-faceted system.³

The second approach to the organization of the concept system is to use categories as a method for analysing and organizing terms without having *a priori* selected a set of categories. This method was first presented by the Indian classificationist Shiyali Ramamrita Ranganathan (1967) in his freely-faceted scheme. He presents a set of 5 fundamental categories such as

- Personality
- Material
- Energy
- Space
- Time

But these are not mandatory for every universe of discourse. A categorial analysis of the universe of discourse will determine which categories should be present. Thus, these categories, determined *a posteriori*, will "admit" any concept that is part of the universe of discourse.

This method leads us to the unique certainty that every universe of discourse can be organized by categories. What these categories are, however, only the universe of discourse can determine.

Dahlberg (1978: 32) also suggests a set of concept categories, based on Aristotle's categories, which may be useful in a concept system.

phenomena, general object and material object-related concepts
 counting and measuring-related concepts
 quality-related concepts
 comparison-related concepts
 operation-related concepts
 state-related concepts
 process-related concepts
 time-related concepts
 position-related concepts
 space-related concepts

6. TERMINOLOGY AND CLASSIFICATION SYSTEMS

The approach of terminology as a concept system is based on the assumption that the concept of concept is a unit of knowledge.

The concept approach ensures the monosemy of terms within a universe of discourse. The concept of system should be seen as a whole made up of sets of concepts that are hierarchically and non-hierarchically related.

To achieve a system with such characteristics, and develop principles for the identification and organization of classes into a truly integrated system, it is suggested that category be introduced as a method of understanding the universe of discourse as a whole.

The theory of classification developed by S. R. Ranganathan in the thirties (the same period Wüster presented his GTT), may be useful for constructing systematic structures of terminologies. The method consists in categorizing the universe of discourse as a first step in organizing concept classes, while taking into consideration characteristics (that determine logical and ontological relations) as the basis for division to form sub-classes and arrays, and to organize these divisions within classes. The ordering of categories, and of classes and sub-classes therein, should have a "comfortably useful" sequence, as Ranganathan would say.

Ranganathan proposes some sequences for classes that are helpful for the planning stage of a terminology, for example, time sequence, evolutionary sequence, spatial sequence, quantitative-measure sequence, complexity sequence, traditional or canonical sequence and literary-warrant sequence.

The organization of terminologies in such terms is fundamental for understanding concepts, for selecting characteristics that will constitute the definition, for identifying synonyms and integrating new concepts into the system adequately. Furthermore, it constitutes the very systematic part of terminologies, as proposed by international standards.

Research in the area of classification/systematization of concepts will certainly help the development of the theoretical basis of this new scientific discipline, along with those studies conducted on term formation and term systems.

Notes

1. "Universe of discourse" means, in this context, the communicational environment of special or technical groups.
2. "System" has been considered as hierarchy by many authors and by international standards.
3. "Facet" is a group of classes with characteristics in common, constituting categories.

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