Chasing a Fata Morgana - Terminology Work and Hypermedia

Anita Nuopponen
University of Vaasa
Faculty of Humanities
Department of Communication Studies
FIN-65101 VAASA, Finland
atn@uwasa.fi

Abstract. In the end of sixties the terminologist were dreaming of computers that could solve their problems. At that time the systems that could be used in order to connect entries in term banks according to the relationships between concepts remained fata morganas, as yet unobtainable. The principle of systematic terminology work and the importance of concept systems have been emphasised from the beginning of the century. Today we have hypertext, multimedia, computer networks, SGML, HTML, CD-ROM etc. which realise, finally, the dreams of being able to represent and retrieve terminological knowledge in a way which is nearer how people think than the traditional alphabetically ordered dictionaries. In addition to these facilities we need also tools for analysing and organising the knowledge. The terminological methods can offer one approach to this.

1. Introduction

Last year we started a project called *Multimedia in the future communication* in the Department of Communication Studies at the University of Vaasa. Since we are a part of the Faculty of Humanities our emphasis is on human communication rather than specifically on its technological aspects. However, our research into the field of communication is being conducted by combining different approaches to multi- and hypermedia. Our multi-disciplinary approach combines e.g. applied linguistics, terminology research, new media & communication studies, philosophy of science, semiotics, technology, computer science and futurology. There are several postgraduate as well as undergraduate students involved in this project. We are co-operating with Europa University in Frankfurt an der Oder in Germany and University of Vienna. Concrete fruits of the project expected in the near future include e.g. *E-Navigo* (an electronic journal), hypermedia data bank (including multimedia terminology and bibliography), CD-ROM for language teaching etc.

In one of the sub-projects, entitled *Language and multi- and hypermedia, we* we are looking both at the multi- and hypermedia in the service of language(s) and language(s) in the service of multi- and hypermedia. One part of this sub-project has a direct relevance to the theme of this paper: *terminology work and hypermedia*. Also in this case our approach is twofold one:

- How can hyper- and multimedia be applied in terminological analysis and terminology work?

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- How can terminological methods be applied in developing multi- and hypermedia presentations?

In the following section, I shall provide a short background for both these questions and discuss what we see as their possibilities and requirements. Only some general questions are raised here.

2. Background - Theory of Terminology

The Theory of Terminology started not on the initiative of linguists, but of engineers and other professionals who became aware and worried about the inconsequences in the language they used in order to perform their duties. Planning, developing, education, selling, standardising etc. are carried out through using language, a language that differs from that of everyday conversation. This type of language is called *LSP*, i.e. *language for special purposes* or *technolect* as opposed to *general language*.

The Theory of Terminology goes back to an Austrian engineer, Eugen Wüster, whose dissertation about the standardisation of electrotechnical terminology [1] was published in 1931. There has of course been much written since and before him, but Wüster was the first one to talk about a general theory of terminology and the need of research and general guidelines for the terminology work.

Wüster's way of thinking as an engineer reflected his view of the language. For him, language was a tool - an important tool - that should be taken care of and standardized just as the other tools engineers need. Terminologies form an important part of scientific and technical communication and they are needed e.g. for ordering, transfer, dissemination, translation, storage and retrieval of scientific and technical knowledge (education, reading, scientific and technical writing of scientific and technical texts) [2]. E.g. IEC (International Electrotechnical Commission) and ISO (International Organization for Standardization and its predecessor) realized this need early on. ISO established a separate committee (TC 37) for terminological principles and co-ordination in order to produce methods for terminology work in different subject fields.

Nowadays, both subject field specialists, terminologists and language specialists among others are involved in both practical and scientific terminological activities. The Theory of Terminology has been developed further and now forms the basis for the discipline called Terminology Science, which is multidisciplinary and has gained a foothold within universities in different contexts. In Vaasa, for example, we teach and carry out research in Terminology Science within the context of Applied Linguistics and Communication Studies; in Vienna it is within the sontext of the Theory of Science and in many other places it is within the context of Translation Theory or terminology data banks etc.

2. Hypermedia for Terminology work

One part of our project which I mentioned was the application of the idea of hypertext for terminology work and more widely for terminological analysis. Our aim is to develop a hypermedia term bank.

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For terminologists, computers have always been natural tools and expectations for their technical development high. Already in the end of sixties the following functions were defined for computers:

1) storage in systemic work,
2) retrieval of terminology, the computers can be used to store equivalent terms which can be retrieved instantly and make the troublesome browsing in the conventional dictionaries unnecessary,
3) co-ordination of terminology work, e.g. bibliographical data. [3]

After abandoning the idea of machine translation there was a move to computer aided translation and since the sixties terminological data banks have been established in spite of restrictions regarding e.g. multilingual word processing, information retrieval and storage [4]. In 1970 Eugen Wüster (†1977) was convinced that there would soon appear on the horizon, as fata morgana computers that contained all terms and the dream of a global "Blixtwörterbuch" that could be accessed from every corner of the world would come true [5]. Today we have nets, hypertext, multimedia, Internet, gophers, World Wide Web, SMGL, HTML etc.

Systematical ordering

Wüster was arguing for thematically and systematically organised vocabularies instead of alphabetical dictionaries that break down the concept systems and split up related concepts. *International Electronical Vocabulary* (IEV), for example, has been compiled systematically since 1924. [6]. Despite being systematically compiled and organised, the printed vocabularies have a restriction which Wüster himself admitted: the entries must nevertheless be organised in a linear fashion [7]. This puts a great pressure upon the presentation of the entries so that the relationships and concept systems can yet been seen.

With the aid of the computers we are able to release ourselves from this linearity. In the first terminological data bases, however, there were restricted possibilities to express relationships between concepts or to give a clear idea of concept systems. Even today many of the traditional data bases ignore the concept systems and give isolated information about concepts and terms. They mainly use the same cross-reference system employed in printed dictionaries. Although the computer makes searching easier, in order to find anything you still need to know the terms and their exact forms. There is no way of browsing the data bank, which is frustrating for a user who does not know the right words but knows the concept. The same problem is met with on-line library catalogues and other data bases.

As soon as hypertext programmes appeared the terminologists realised their value and started to design their own applications (e.g. *Hypertepa, Terminologizer, Nomenclator*, etc. [8]. *Nomenclator* created by Riggs & Mälkiä is a conceptual term bank, rather than being term-oriented. It does not list words or terms describing their meanings as dictionaries do. It is meant to help scholars to represent concepts, not to define words. [9]

The next generation of term banks to be created look likely to be knowledge based systems, assisted with AI. An example is the prototype terminological knowledge base COGNITERM constructed using a knowledge engineering tool called CODE, *Conceptually Oriented Description Environment*. [10]. Many others are under construction, while the biggest term banks are still sticking to the old technique and structure. Different

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kinds of terminological management software packages for individual use is on the market and more is coming.

Instead of simple word banks with only definitions and various data elements, the future term banks will provide an interface to other, larger data banks with complete texts, graphics, sound and animation. The problems however are the same as with all other new generation databases: the eventual users do not yet have the equipment to retrieve information from them. (That makes the old systems still attractive in comparison to the new ones.)

In our project we are planning a hypermedia term bank, principally for research and educational purposes. We want to combine pictures, sound and video with text. We have thusfar not been enticed by all the applications and development tools available to date and have just been waiting for the perfect ones to appear - just as Wüster was waiting for the computers fit to tacle terminology work. Presented at this conference will be a hypermedia knowledge bank built by Budin and Stockinger.

3. Terminology work for hypermedia

Another purpose of our research is to develop the terminological methods to meet the demands of hypermedia systems. We have proceeded as far as the first phase in this task. We have been doing basic research in terminological methods and have been developing them further [11]. The next phase focus on applying terminological methods in concept mapping for hypertext.

Analysing and organising subject field knowledge

As I mentioned earlier, the most fundamental basis of the Theory of Terminology is that of systems thinking. The basic component of the theory is the concept of the concept. We do not start from words and interconnect them as semanticians do, but rather we link together concepts that are related. Related concepts are linked together thus mapping the special field knowledge. One of the tasks of the Terminology Science is thus to provide methods for organising subject field knowledge. [12] It started, on the one hand, with compiling, thematically or systematically, technical vocabularies and standards and on the other hand with organizing and cataloguing books in libraries. We maintain that these methods can and should be used more widely e.g. by researchers, technical writers, translators, science journalists, data base developers, CD-ROM producers, encyclopaedia compilers, teachers, text book writers etc. and all other information professionals who require tools for analysing expert knowledge.

In order to develop a hypertext presentation it is necessary to analyse the concepts and concept fields. Patricia Ann Carlson [13] says that in order to determine user satisfaction, we can ask the following three questions about every document, whether it be off-line or on-line:

1) contents: What does the document say?
2) representation: How is the information organised and stored?
3) view: How is the data accessed?

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Here the theory of terminology can offer its methods and tools as follows:

1) Contents: Terminology control, definition rules in order to produce correct, unambiquous, up-to-date and appropriate content that promotes the effectiveness of the document for the users.

2) Representation: Use of concepts, concept relations and concept systems for creating a logical structure that promote the usefulness of the document.

3) View: Concept systems and relations can be used for effective information mapping, as bases for table of contents, chapter breaks, headings etc. Graphical representations of concept systems are important tools for concept and term analyses, and for representing and retrieving knowledge. They also have didactic value.

Concept Systems

Hypertext researchers talk about associationalism; e.g. Vannever Bush, who created a prototype hypertext system, *Memex*, which, he maintained, worked in the same way the human mind does [13]. The most usual way of representing knowledge is, however, in the form of hierarchies, e.g. types of bicycles. Not all the important concepts and special field knowledge is, however, very ammenable to strict hierarchies. A second type whic is often presented is the partitive concept system, e.g. parts of bicycles. These two types of concept system have been used for terminology work for a long time. In addition to them there are also different types of concept systems with temporal element, e.g. processes. I make a distinction between purely temporal concept systems and causal concept systems. There are further concept system types. Hypertext makes it possible to combine entries into more complex systems, which may lead to a mess if the analysis is not done properly. For this purpose we have developed different types of models of concept systems. Presenting all of them belongs, however, to another paper. [11]

Visual representation of knowledge

Hypermedia opens up a miriad of new possibilities for the represention of concept systems if compared to the potential of printed media, in which the visual representation of special field knowledge is restricted for numerous reasons. In many cases it is important, from the point of view of understanding, to see pictures instead of only reading a highly complex and abstract description. In education the meaning of the visual factors can't be overvalued. Hypermedia makes it possible to present visually many different kinds of relationships between concepts and themes. Also this aspect belongs to our project.

Conclusion

Today we have hypertext, multimedia, computer networks, SGML, HTML, CD-ROM etc., which realise finally the dreams of being able to represent and retrieve terminological knowledge in a way which is nearer how people think than the traditional alphabetically ordered dictionaries. In addition to these facilities we need also tools for analysing and organising the knowledge. The terminological methods can offer one approach to this.

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The fata morgana Wüster saw at the end of the sixties has for some time now been rapidly turning into a reality - but we are already chasing new fata morganas.

References

[1] Wüster, Eugen (1970). Internationale Sprachnormung in der Technik. Besonders in der Electrotechnik (Die nationale Sprachnormung und ihre Verallgemeinerung). Dritter, abermals ergänzte Auflage (erste Auflage 1931). Bouvier u. CO. Verlag, Bonn.

[2] Felber, Helmut (1984). Terminology Manual. Unesco: International Information Centre for Terminology (Infoterm), Paris. p. 1.

[3] Wüster, Eugen (1969). Die vier Dimensionen der Terminologiearbeit. Mitteilungsblatt für Dolmetscher und Übersetzer. März 1969, Nr. 2/15, 1-6. (See also Felber 1984 [2], who translated Wüster's text almost word by word)

[4] The first known effort to establish a terminological data bank was project DICAUTOM 1963 by the European Coal and Steal Commission. In the beginning of the seventies it was revived as EURODICAUTOM at the same time as the French NORMATERM and the Canadian Banque terminologie du Québec were born.

[5] Wüster, Eugen (1970). Die internationale Terminologie im Dienste der Informatik. In: Monda Lingvo-Probl., vol. 2.1970, 138-144. p. 143.

[6] Wüster, Eugen (1956). Das Internationale Elektrotechnische Wörterbuch. In: ETZ-A, Bd. 77, H. 13. pp. 415-418.

[7] Wüster 1956: 416 [see 6]

[8] Hypertepa, Centre for the Technical Terminology, Helsinki; Terminologizer, Dept. of Communication Studies, Vaasa; Nomenclator, Riggs & Mälkiä, University of Hawaii.

[9] Riggs & Budin & Mälkia: Descriptive terminology management. An unpublished manuscript.

[10] Bowker, Lynne & Meyer, Ingrid (1993). Beyond "Textbook" concept systems: handling multidimensionality in a new generation of term banks. In: Schmitz, Klaus-Dirk (ed.) (1993). Terminology and Knowledge Engineering. Proceedings Third International Congress on Terminology and Knowledge Engineering 25-27 Aug. 1993. pp. 123-137. Indeks Verlag, Frankfurt am Main.

[11] See Nuopponen, Anita (1994). Begreppssystem för terminologisk analys. University of Vaasa. In print.

[12] See e.g. Budin, Gerhard (1993). Knowledge organization and moelling of terminological knowledge. In: see [10], pp. 1-7.

[13] Carlson, Patricia Ann (1988). Hypertext: A way of incorporating user feedback into online documentation. In: Barrett (ed.) Text, ConText, and HyperText. Writing with and for the Computer. 93-110. The MIT Press, Cambridge, Massachussetts, London, England.

[14] Bush, Vannever (1945). As we may think. In: *Atlantic Monthly* 7 (1945), pp. 101-108.

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