
Experts and Terminologists: Exchanging Roles in the Elaboration of the Terminological Dictionary of the Brenner Base Tunnel (BBT)

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Abstract

This paper presents the Italian-German Terminological Dictionary of the Brenner Base Tunnel (BBT) produced and printed in 2011 by the European Academy of Bolzano. In particular, we describe the role played by domain experts and terminologists during the elaboration of the dictionary, which was different from the one that is usually assigned to them in terminological projects. This switching of roles had several consequences on the structure and content of the dictionary, which we will discuss. We also briefly illustrate the challenges faced and how we approached specific problems, e.g. the structure of the definitions, the managing of synonyms and variants, the varied nature of terms selected for the dictionary and their specific treatment with a view to the needs of the target users. The two main target groups consist of experts and semi-experts from various professions who are confronted daily with terminology pertaining to a large array of specialised domains (from environmental to engineering to legal terminology).

Keywords: Terminological dictionary; Domain experts' role; Terminology workflow

1 Introduction

The Brenner Pass is located between Italy and Austria in a favourable position, making it one of the main thoroughfares connecting Central and Northern Europe with the Italian peninsula and the Mediterranean area. Passenger and freight traffic on the motorway and railway crossing on this rather low Alpine pass (1372 m above sea level) is particularly intense all year round and in constant growth (cf. Maino et al. 2011: 10). The ensuing social, economic and environmental consequences call for an improvement of the railway line between Munich and Verona in order to favour a modal shift from road transportation to rail transportation for goods, in order to achieve a more efficient mobility system and relieve the population along the railway line from transit traffic (Maino et al. 2011: 8). The Brenner Base Tunnel (BBT) is the most important element of this improvement project and will be 55 km long, connecting Innsbruck in Austria with Fortezza in Italy. Its completion is currently scheduled for the year 2025.

For the two neighbouring countries of Austria and Italy to be able to cooperate efficiently in the realisation of the project, all relevant documents must be available in two languages, i.e. German and Italian. This calls for a large number of translations, with technical, legal, administrative and commercial content produced over a very long period. For smooth communication, all these texts need to use correct and coherent specialised terminology pertaining to a vast array of domains in both languages. Therefore, the scope of the BBT project, its duration, the number of different professionals involved, the need for overcoming language barriers as well as legal/administrative barriers, together with the complex and varied nature of the terminology needed, represent the background for the creation of a dedicated bilingual dictionary. This dictionary is the Italian-German dictionary *Dizionario Terminologico della Galleria di Base del Brennero/Terminologisches Wörterbuch zum Brenner Basistunnel*, which aims at supporting transnational communication and cooperation for all issues related to the BBT.

The dictionary was planned and created by domain experts and terminologists in close cooperation. However, unlike standard terminology projects in which terminologists perform most of the activities and are ideally supported by domain experts as revisers and consultants, the BBT terminological dictionary was compiled by experts, while the terminologists took over the role of consultants and quality controllers. The knowledge possessed by the domain experts on the special language and conceptual structure of the domains treated was channelled and directed into a precise terminological working method. This exchange of roles with respect to the most common workflow in terminology proved to be challenging but stimulating for both groups. In section 5 we discuss the main challenges faced.

2 The BBT dictionary

The BBT dictionary was promoted and financed by the Brenner Base Tunnel Societas Europae (BBT SE). The BBT Society commissioned the creation of a bilingual dictionary to a group of mainly monolingual Italian or German speaking experts in territorial planning, land management, engineering and mobility, who sought advice from a group of bilingual terminologists. The terminologists supported the dictionary authors in defining two main aspects before starting work, i.e. the target users of the dictionary and the methodology to be adopted during compilation, so as to avoid inconsistencies and the need for later adjustments.

The structure of the definitions and the treatment of variants/synonyms, for example, consistently follow a clearly onomasiological rather than semasiological approach. The onomasiological method is typical of terminology work, as it considers the key concepts of a specialised domain and the relations existing between them as central elements for the selection and definition of the terms to be included in the dictionary. The lemmas in the dictionary being concept-based, all synonyms or variants (e.g. a full form and its corresponding acronym) are listed and defined together, since they all designate the same concept. Unlike dictionaries that follow a semasiological approach, two synonyms are not

explained separately in distinct lemmas: the synonym only has a clear reference to the lemma of the main term, where all necessary information is given, including all equivalents in the other language. The authors and sponsor deemed it necessary to target the dictionary mainly at experts and semi-experts participating in all phases and aspects of the BBT project. The function of the BBT dictionary is therefore to support both groups of users in understanding and producing texts in the foreign language. Experts “will have no reception problems within [their] own field. [They] may have to acquire new knowledge, but [they are] not likely to find this in any lexicographical dictionary” (Bergenholtz & Kaufmann 1997: 102). Thus, they will predominantly use the dictionary for text production and retrieving foreign language terms. Semi-experts are potential dictionary users who come from other related subject fields that are relevant but not strictly specific to railway tunnel projects, e.g. engineers, surveyors, geologists, installers, etc. These professionals work in the public or private sector and daily interact with the world of railway construction and the BBT (cf. Bergenholtz & Kaufmann 1997: 101). They will need to find all synonyms and variants of a term as well as definitions in order to get a better picture of each concept.

The BBT dictionary contains about 2000 terms in German and Italian from diverse domains, ranging from railway construction to tunnel building, economy, energy, geology, telecommunications, transport/mobility, social issues and environmental terminology, thus encompassing – next to strictly technical terminology – also organisational, administrative and legal terminology (cf. Maino et al. 2011: 14).

3 Experts and terminologists: standard forms of cooperation

Keine Terminologie ohne Fachleute – keine Fachleute ohne Terminologie¹ (RaDT 2013: 9)

The quotation above expresses the essence of terminology. Terminologists and experts must work side by side and create synergies to achieve a reliable and high quality terminological product. In principle, terminologists retrieve, reference and record the terms that pertain to a specialised domain in one or more languages (RaDT 2004: 2; Chiocchetti et al. 2013: 41-42), while domain experts are normally consulted for explanations and information (RaDT 2013: 7-8). Often they also revise the final product of the terminologists.

Usually terminologists start by studying and delimiting the domain to be processed terminologically, which is often subdivided into smaller subdomains. To this purpose, terminologists acquire and skim relevant and up-to-date reference material, which may also be collected or selected as indicated by domain experts. The material is collected in all languages that are to be included in the terminologi-

1 “No terminology without domain experts – no domain experts without terminology” (translation by the authors).

cal product, making sure that it is original material written by expert native speakers, so that it reflects the actual language used by the community of experts of a given domain.

This material serves as a basis for understanding the key concepts of the domain under analysis, which are organised in concept systems to illustrate the relation between each concept within the specific domain or sub-domain. The material is also used to retrieve all the terms that designate the concepts of a specialised domain. “A term is a designation consisting of one or more words representing a general concept in a special language in a specific subject field” (ISO 2009:704: 7.2.1). There might be more than one designation for the same concept, i.e. there might be synonyms (ISO 2009:704: 7.2.4). Also term variants, e.g. abbreviated forms like clippings and acronyms, are common in specialised domains (cf. ISO 2009:704: B.2.4).

Based on this preparatory research and analysis, terminologists then compile (or update) fully fledged terminological entries with relevant information, i.e. with definitions, contexts of use, term variants/synonyms, usage notes etc. The most important element of a terminological entry is the definition, as it conveys the meaning of a concept within the specialised domain to which it belongs. All the other pieces of information contribute to explaining how the terms and variants that designate a concept are employed within a specialised domain.

Finally, with the help of all information gathered in the source language and the structure of the relevant concept-system, terminologists retrieve the equivalents in the target language. Target language terms are then processed terminologically in the same way as the terms in the source language are. If no equivalent exists, terminologists may propose new terms (translation proposals) to fill the terminological gaps (see section 5.5).

Written and human sources (i.e. domain experts) may be consulted by terminologists for information and explanations at any time during the entire process. Domain experts are preferably involved in the planning and realisation of terminology projects from the very beginning. Usually their role consists in supporting terminologists (RaDT 2013: 7-8). At the beginning, they can help to plan and organise terminology projects, especially by providing information on relevant reference material and selecting it. Their initial input is also important when delimiting the domains and subdomains to be processed terminologically.

As terminology work proceeds, domain experts may be asked to select the terms that were extracted from the written material by the terminologists, i.e. to choose which terms shall become lemmas of a dictionary or terminological entries in a database. Experts can also check concept systems and verify the correctness of the terms, synonyms and associated definitions. Domain experts usually provide competent advice in case of any doubts. Finally, being part of a scientific community and/or of a practical community, they represent the ideal channel for disseminating the results of the terminology work to their peers.

As we have seen, domain experts normally act as consultants and/or revisers. They are of paramount importance for the success of terminology work and represent a precious source of information, since they assess the quality of source documentation, explain the meaning of concepts belonging to their domain of expertise and/or check whether the terminology collection is correct and complete. However, what they usually do not do is compile terminological entries themselves.

4 Experts and terminologists: exchanging roles for the BBT dictionary

For the creation of the BBT dictionary domain experts and terminologists exchanged roles. This time the terminologists acted as consultants and revisers, while the experts took over most of the work concerning the compilation of the dictionary entries.

The advisory role of terminologists started with helping the experts select the most up-to-date and authoritative sources. As the experts are able to judge personally which pieces of information are correct and precise, they tend to disregard their provenance and to treat all types of reference material in the same way, from highly specialised technical manuals to commercial web pages. By applying strategies for source evaluation and selection learnt from the terminologists, the authors managed to produce a more homogeneous and complete dictionary. Current scientific and technical sources were consistently preferred to general language dictionaries or encyclopaedias. In any case, information was always double-checked and carefully evaluated.

Terminologists provided support also in the initial term selection phase. In fact, they strived to agree with the experts on a coherent set of related terms. For the dictionary this sometimes meant discarding a very specialised – albeit possibly useful – lemma and including a maybe less tricky lemma instead, in order to ensure that most concepts in the concept field of a specific subdomain were represented. This compromise in term selection likewise allowed reaching a higher level of homogeneity in the dictionary.

Great efforts were made by the terminologists in revising definitions. They convinced the experts that the typical structure of terminological definitions could represent a useful definition strategy, especially for semi-experts. Terminological definitions start with stating the superordinate concept and then list all the characteristics that distinguish the concept under analysis from its related concepts nearby (see section 5.6). In this way they provide essential information in a very compact form and help users to quickly understand the position of a concept within its specialised domain. Achieving a more systematic and coherent structure for all definitions also allowed the dictionary to be turned into a more consistent product.

Terminologists took over several other methodological aspects, e.g. by supervising the rigorous treatment of synonyms and abbreviated forms and their cross references to the main entry. They performed the terminological revision, i.e. they checked the consistency of terms and definitions. Most important, they checked whether the terms and definitions in Italian and German actually all referred to the same concept, thus making up for the lack of language competences of the domain experts. In some cases they actually retrieved the equivalents in the target language or advanced translation proposals. Finally, terminologists performed the linguistic revision in both Italian and German.

This swapping of roles was essentially born out of necessity, as the domain experts lacked the necessary competences and methodological basis for dictionary-making as well as (partly) lacking the linguistic competences in both working languages, while the terminologists could not take over their

standard role due to lack of time and financial means. However, despite the challenges faced, the co-operation in this “reversed form” proved stimulating and fruitful for both parts.

5 Challenges faced and compromises reached

Before and during the compilation phase of the dictionary the domain experts were trained by the terminologists to follow the basic principles of terminology and of dictionary-making. In some areas it was particularly difficult to create a common knowledge base and achieve consensus on a methodology, so that both parts had to agree on compromises, as explained in detail in the following paragraphs.

5.1 Hierarchy of sources

Many different types of sources can be used for terminology work (cf. ISO 10241-1:2011: 4.3.5.2). Their respective relevance will vary according to the aim, type and content of terminology work, the domain(s) treated, the languages considered, the end users, etc. (Chiocchetti et al. 2013: 18). Usually terminologists give preference to authoritative sources like legal documents, standards, documents generally recognised by the scientific community (e.g. textbooks) (ISO 10241-1:2011: 4.3.5.2). Often the reference material is classified hierarchically, with the most official and authoritative sources at the top (e.g. laws, standards, etc.) and the less authoritative ones at the bottom (e.g. private webpages, commercial material, etc.). Information retrieved in sources classified at a higher level of the hierarchy will be preferred to information found in documents filed at a lower level. Contrary to this terminological practice, the experts working on the BBT dictionary often used material from general encyclopaedias and from popular websites (e.g. Wikipedia), which are easily retrieved on the Internet but cannot always be considered reliable or specific enough. This is the reason why they are generally avoided by terminologists or at most used for information retrieval, but seldom quoted.

For the BBT dictionary, since the expertise of the authors allowed them to assess the correctness and quality of definitions found in “unconventional” reference material, many definitions were accepted and cited within the dictionary whenever no other source of information was available. This compromise allowed a faster compilation of parts of the dictionary without any notable loss of quality.

5.2 Subdivision into glossaries

According to standard terminological practice, when treating large or very diverse sets of data (see section 2), work is subdivided into thematic glossaries to facilitate compilation and revision. This practice was new to the authors who nevertheless quickly grew accustomed to the method. In the final version of the dictionary all terms could still be listed in alphabetical order, thus ensuring imme-

diate retrievability of each term as well as of all variants or synonyms by the end-users (Maino et al. 2011: 14).

5.3 Term selection

Due to restrictions in space, it was not possible to compile complete concept systems for all glossaries and accommodate all relevant terms in the dictionary. Term selection was therefore guided by the relative relevance for the specific BBT project and not strictly by conceptual diagrams of each domain, as terminologists normally strive to do with the aim of treating all domains equally.

Catering to two different groups of users likewise required a series of compromises in the selection of terms and variants/synonyms to be considered. Experts tend to use highly specialised vocabulary (e.g. also consisting of acronyms, initialisms and formulas) that is monosemic and unambiguous to avoid problems in interpretation (cf. Sobrero 1993; Cortelazzo 1994). Semi-experts, however, call for what is defined as a “variationist approach” in terminology, i.e. an approach where all synonyms and variants used to designate a concept are considered, whether they be “full forms, such as simple, compound or complex terms [and] [...] all their variations” (Bertaccini & Lecci 2009), or abbreviated forms (see Fig. 1). To this aim, the dictionary builds a network of references from all synonyms and variants (e.g. acronyms) to the main entry containing the definition of the concept (see Fig. 2 and 3).

tunnel boring machine Sinonimo: fresa (2), talpa Sigla: TBM Definizione: Macchina che permette lo scavo meccanizzato con fresa a tenuta idraulica ed il contemporaneo rivestimento con conci prefabbricati. Fonte: http://www.snamretegas.it:17.11.2004	Tunnelbohrmaschine Synonym: Fräse, Tunnelfräse Abkürzung: TBM Definition: Gerät zum Lösen von Gebirge im Zuge des Tunnel- oder Stollenbaus. Das Lösen erfolgt hierbei mechanisch und über den vollen Querschnitt des Ausbruchs. Quelle: http://www.bauwerk-verlag.de:17.11.2004
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Fig. 1: Entry tunnel boring machine/Tunnelbohrmaschine with synonyms (= sinonimo/Synonym) and initialisms (= sigla/Abkürzung).

5.4 Managing synonyms and variants

The consistent treatment of synonyms and also variants —with the respective references from the synonym/variant to the main defined terms — was taken over and managed by the terminologists. Experts tend to disregard the importance of terminological variation, because they have all the synonyms and variants in mind. But for a semi-expert dictionary user it might, for example, not be so easy to read the full form behind an acronym used in a text. By listing all designations that refer to the

same concept in separate lemmas as well as in alphabetical order in the BBT dictionary, with consistent cross-references to their respective full forms and/or main terms (see Fig. 2 and 3), maximum retrievability of information for all end-users could be ensured.

<p>fresa (1) Definizione: Utensile a taglienti multipli usato in genere sulle fresatrici per l'esecuzione di lavorazioni meccaniche. Fonte: Aa. vv., 1988. La nuova enciclopedia delle scienze. Garzanti, Milano.</p>	<p>Fräser Definition: Ein- oder mehrschneidiges Einsatzwerkzeug, das mit einer Spannzange an einer Fräsmaschine befestigt wird. Über eine Spindel wird der Fräser zum Rotieren gebracht und in das zu bearbeitende Werkstück aus Metall, Kunststoff oder Holz eingetaucht. Durch spannende Wirkung wird das Werkstück bearbeitet. Quelle: http://www.das-baulexikon.de:14.03.2011</p>
<p>fresa (2) Vedi "tunnel boring machine".</p>	

Fig. 2: Entry *fresa (2)*, cross-reference to the main Italian term *tunnel boring machine*.

<p>Fräse Siehe „Tunnelbohrmaschine“.</p>

Fig. 3: Entry *Fräse*, cross-reference to the main German term *Tunnelbohrmaschine*.

5.5 Diverging treatment of legal/administrative terminology from purely technical terminology

The nature and origin of the terminology used within the BBT project is quite diverse (see section 2). Legal terminology, which is for example contained in building regulations, poses a particular challenge in such a context, since it is much more difficult to find conceptual equivalence in the legal/administrative than in the technical domain. Legal and administrative terminology is always strongly connected to a specific legal system with its own cognitive and conceptual structures, as well as its written or oral sources (cf. Gambaro & Sacco 1996: 9; Sandrini 1996: 138; Šarčević 1997: 232). For this reason, it might not always be possible to find an equivalent in the target language; the concept designated by the term might be specific to the source legal system and source language and be completely unknown in the target legal system and language. This situation creates a terminological gap. The presence of a terminological gap causes the need to look for strategies of translation other than equivalence (e.g. paraphrase, neologism, etc.). In the BBT dictionary, terminological gaps in the legal/

administrative terminology were faced by offering translation proposals that conveyed the meaning of the concept in the source legal system and source language into the target legal system and language (see Fig. 4). Due to the intrinsic connection of legal terminology with its legal system, it was not possible to borrow legal terms from other legal systems.

<p>piano comunale di classificazione acustica Sigla: PCCA Definizione: Piano che definisce le norme finalizzate alla tutela dell'ambiente e della salute pubblica dall'inquinamento acustico prodotto dalle attività antropiche, disciplinandone l'esercizio al fine di contenere la rumorosità entro i limiti normativamente stabiliti. Fonte: http://www.arpat.toscana.it:03.02.2011</p>	<p>Lärmklassifizierungsplan der Gemeinde Quelle: EURAC (Übersetzungsvorschlag)</p>
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Fig. 4: Translation proposal in German for the Italian administrative term *piano comunale di classificazione acustica*.

Another approach, however, was followed for gaps in the technical terminology. In this case, problems mainly concerned a different level of evolution of the tunnel building techniques in Italy and in Austria, with the ensuing absence of some terms that designate very specific concepts. As the technical terminology used in Switzerland in both Italian and German is very complete and up-to-date, several Swiss sources helped to fill the presumed gaps (see Fig. 5). For similar reasons, some sources of information from Federal Germany could be referred to for the German language terminology.

The terminologists had to explain and discuss this diverging treatment with the dictionary authors. Since none of them was a legal expert, the implication of legal comparison across national borders was not immediately clear and had to be motivated and explained.

<p>Bohrkopf Definition: Vorderster Teil einer Vortriebsanlage, der mit Rollenmeißeln bestückt ist und der beim Abschlag den Fels löst. Quelle: http://www.islisbergtunnel.ch:29.04.2005</p>

Fig. 5: Entry *Bohrkopf* with definition from a Swiss website about tunnel building.

5.6 Definitions

Experts have the tendency to provide longer encyclopaedic definitions rather than much more compact classical terminological definitions. They tend to give more information than the amount strictly necessary for a mere definition of the concept, tending to add explanations on how a defined concept is employed within their domain of expertise (see Fig. 6).

The traditional, most explicit and precise definition in terminology is the intensional definition, stating “the superordinate concept immediately above [the concept that is being defined], followed by the delimiting characteristic(s)” (ISO 704:2009: 6.2) that distinguish it from coordinate or from other related concepts. This type of definition allows full and systematic identification of a concept with respect to all others in the specific domain (Sager 1990: 42). Yet it is very brief and not always sufficient for laypersons or semi-experts to really understand the meaning and usage of the concept defined.

In this case the terminologists gave way to the desires by the dictionary authors for a more in depth explanation of some key concepts. In the dictionary, which has a very compact structure without any notes or comments, definitions were allowed a more flexible structure, sometimes leaving room for the inclusion of necessary additional information and clarifications.



Fig. 6: Definition of *Schwermetall* with additional information.

6 Conclusions

This role-switching exercise proved very fruitful for both sides. The experts became familiar with the basic principles of terminology work and dictionary-making; particularly the evaluation of source material and the definition-writing skills were considered useful to them beyond the BBT dictionary itself. The terminologists learnt how to find pragmatic solutions to practical problems, as well as how

to reach compromises between standard terminological practice and the limitations of a printed reference work that is aimed primarily at experts and semi-experts, rather than at translators and other language professionals.

The result of this exchange of roles is a dictionary based on many more compromises than other terminological projects. Terminologists usually take over most of the work and the role of the experts is limited to sporadic interventions as advisers and proofreaders. As a consequence, terminologists often have the last word on dictionary structure and content, even though the opinion of the experts is always greatly considered and systematically taken into account. However, for the BBT dictionary, the advice of the terminologists during dictionary compilation was generally limited to more formal aspects, such as revising the structure and wording of the definitions, and to methodological issues, e.g. the consistent treatment of synonyms and short forms.

Great compromises were reached, for example, concerning definitions. As we have seen, in the BBT dictionary definitions still follow the classical terminological structure whenever possible, but their content goes beyond the mere identification of superordinate concept and delimiting characteristics. Definitions thus often include additional (technical) information that the authors considered necessary and useful for either peers or semi-experts. Another compromise was reached for the treatment of linguistic information that is normally given by terminologists in their work, i.e. grammatical information, example sentences, notes distinguishing the contexts of use of different synonyms and term variants, language register, collocations, etc. This type of information is basically absent from the dictionary, due to the fact that the target groups of the dictionary do not primarily include translators and language professionals. While translators might wish for specific linguistic information, this is often unnecessary for experts, so more space was devoted to treating a larger number of lemmas.

The BBT dictionary project has finally proven that, given the different backgrounds and approaches of terminologists and domain experts, it is advisable to provide detailed guidelines on how to handle specific aspects (e.g. the structure of definitions) in order to work along common guidelines and principles from the very beginning (Chiocchetti et al. 2013: 46). It has also shown that it is indeed possible to envisage different forms of cooperation between domain experts and language experts, still ensuring a high level of quality of the final product.

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