This volume offers a state-of-the-art view of research into interdisciplinarity, language and Information and Communication Technology (ICT) by providing an overview of teaching proposals within a university context. Interdisciplinarity is understood here as how language expresses the discourse and lexis of specialised knowledge in science, technology and the professions. Language helps in the creation of these different fields and constitutes a strategic tool that, if harnessed correctly, will facilitate competitiveness on an international level in order to boost technological, scientific, economic and educational growth. Interdisciplinarity, language and ICTs need to be taken into account to address the real needs of industry, commerce and translation in educational institutions and the professions.

The contributions in this volume address themes that are crucial to the demands of modern society: intercultural business communications, one of the most challenging areas of specialised discourse and commerce; ICT and specialised translation, a current issue of the utmost relevance; terminology applied to translation; language acquisition in virtual environments; training interpreters through ICT; exploring the commercial needs of language industries; corpus-based research and ICT applications in specialised dictionaries; university e-learning courses; and the state of research on specialised languages in Latin America.

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PETER LANG

INTERDISCIPLINARITY AND LANGUAGES

CURRENT ISSUES IN RESEARCH, TEACHING, PROFESSIONAL APPLICATIONS AND ICT

Francisca Suau-Jiménez and
Barry Pennock-Speck (eds)

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3 Translation-oriented Terminology Management and ICTs: Present and Future

1. Introduction

The need that specialized translators have for knowing terminology, solving terminological problems and managing term-related information within the translation process is nowadays in no doubt. Translators were the first group to be aware of the importance that term-related issues and terminology management had in their everyday tasks (Antia et al. 2005). Concerning term-related tasks, translators should be able to (a) identify and interpret the terminology in the source text (ST) adequately; (b) find and use proper documentation and information resources both for acquiring various kinds of information about terms (conceptual, pragmatic, and linguistic), and for applying their correct equivalents; and (c) retrieve and store terminological data.

The development of ICTs designed for the translator's workbench has been phenomenal over the past decade. Ramirez-Polo and Hang-Ferrer (2010: 24) suggest as possible reasons, firstly, the rapid evolution of the Internet and other innovations in hardware and software, and the increase of texts to be translated as a result of the globalization of the market, products and services. Another reason could be the pressure put on translators to produce target texts quickly and efficiently. Finally, translation in general, and translation-oriented terminology in particular, have become increasingly computerized over the past twenty years.

This chapter addresses different aspects of terminology management and its computerized workbench, all with regard to translation-oriented terminology tasks and ICTs. It begins with a brief description of the improvements carried out in terminology management over time, followed by some

key definitions of terminology management highlighting the process carried out within the context of translation. It then goes on to describe and classify the types of translation practices related to terminology management, including the software that can be used in a particular task. Finally, future prospects with regards to the translators' workstation in its relation to terminology work will be briefly examined.

2. Qualitative improvements in terminology management

The 1980s witnessed the first electronic dictionaries and terminology management systems which were designed to be used in personal computers and, consequently, available for a great number of users. Translators have been able to use these tools to create, maintain, manage and disseminate their own term bases to include terminological units and their related information gathered during the documentation or translation process (Bowker 2003: 51). Nevertheless, this first generation had its limits, such as the following (Bowker 2002: 78):

1. It was not possible to share terminological repositories in local networks;
2. They were unidirectional in nature, i.e., work could be carried out from English to Spanish, but this linguistic direction could not be reversed;
3. The number and type of data fields; and
4. The storage capacity.

Two of the most powerful and best-selling terminology management tools integrated in Translation Memory Systems are *MultiTerm* and *TermStar*. The first *MultiTerm* version was launched for DOS in 1990 and two years later for Windows. *TermStar* was launched for the first time in 1991 (DOS), and it adapted for the Windows (3.1) platform with *Transit/TermStar* 2.0 in 1994. Since then, a lot of new tools have been marketed and updated to

conform to the recent improvements made by computing and linguistic engineering. The implementation of state-of-the-art translation technologies, such as the above mentioned translation-oriented terminology management systems has proved to be very useful both in supporting, facilitating and speeding up translators' work, as well as in providing resources that can be reused in the future.

In a previous paper (Vargas 2007: 47), the qualitative improvements that terminology management in general achieved were mentioned and classified into four main benefits. The first was concerned with quick and easy access to existing multilingual terminology and documentation via the Internet, which also facilitates the second, i.e., the compilation of a collection of electronic texts to build up a domain-specific representative corpus to be processed for terminology purposes. It is necessary to highlight the fact that terminology is a corpus-based activity. From a corpus that is gathered, the third benefit is gained; that is the possibility to extract specialized knowledge with the help of semi-automatic term extractors. The final improvement that will be presented refers to terminology management systems. Thus, the information taken from the text material can be organized in the form of electronic registers, each one having all the information related to each and every term, distributed in different fields (term, definition, context, part of speech, etc.). In summary, in the last twenty years or so, four technological concepts have played a leading role in terminography: the Internet, electronic corpora, term extractors (using linguistic, statistical or hybrid approaches) and TMS, also know as terminological databases.

3. Translation-oriented terminology management – Some definitions

Terminology management is defined by Galinski and Budin (2005) in the following way:

> Terminology management is primarily concerned with manipulating terminological resources for specific purposes, e.g., establishing repertories of terminological resources for publishing dictionaries, maintaining terminology databases, or ad hoc problem solving in finding multilingual equivalences in translation work or creating new terms in technical writing.[1]

From this definition, we can distinguish two different axes: one concerned with systematic terminology projects, and the other related to ad hoc ones. On one hand, systematic terminology aims to develop wide-coverage terminology resources (vocabularies, databases, dictionaries, etc.) to meet the needs of a specific kind of user; while the second focuses on handling precise terminology problems or working on a small group of terms. Both systematic and ad hoc terminography can be carried out by translators, but not necessarily. In fact, within a translation context, translation will be more frequently exposed to ad hoc terminology work. Candel-Mora (2006) points out that the main difference between systematic and translation-oriented terminology work is that the latter is characterized by the limitations inherent to the peculiarities of the work environment, and more specifically, to translation deadlines and planning, which leads translators to conduct ad hoc terminology work or work addressed to solving the terminological problems encountered during the initial phase of ST analysis. Wright and Wright (1997:148) illustrate these differences in terms of methodology:

> In scope the methodology, the systematic model is *subject-field-driven*. [...] In contrast, ad hoc terminology management is *text-driven*: terminologists and translators creating their own terminology resources are presented with random extractions from a domain.

Both systematic and ad hoc terminology management is a computer-assisted activity. In translation, it means that the human translator, in any of the roles s/he may play (terminologist, localizer, translator, reviewer, etc.), uses computer software that has been designed to support and facilitate

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1   Taken from <http://cslu.cse.ogi.edu/HLTsurvey/ch12node7.html>, accessed 18 October 2010

all translation, textual and terminological tasks, i.e., from those aiming at acquiring knowledge through documentation, to translating and generating the target text with the same format and visual aspect as the ST. Then, a current definition for translation-oriented terminology management would refer to the computer-assisted creation, maintenance, management and dissemination of term databases useful for translation. In this article, by translation-oriented terminology management we will refer to that performed by translators and integrated into a translator's workbench.

The software generally used within this context is a Translation Memory (TM) – which falls into the broad category named 'computer-aided translation (CAT) systems'. A TM is made up of different components, the most important being two data bases: the translation memory, a computer file that contains translation units (aligned pairs of source and target language segments); and the terminology database, a computer file designed to store terminological information. It is important to note that TMs can read and work with more than one translation memory and term base at the same time.

Next I will describe and classify the types of practices related to terminology management that translators go into during the process, the purpose of which is to provide an account of the technologies these professionals use or can use for a specific task. This description will be provided from a user's point of view without going very deeply into technical details.

4. Practices in translation-oriented terminology management

All fields of knowledge or professional activity are characterized by a significant amount of terminology that is used in oral or written texts circulating in the field. Terminology in specialized texts is considered to be a 'translation problem', i.e., an obstacle that any translator has to overcome when the source text is decoded and/or the target text is reformulated. In fact, it is estimated that over 40% of the time invested in a technical or

scientific translation is devoted to solving terminological problems inherent to each text (Arntz, 1993, Walker, 1993). Working out term-related issues, like research in neologisms, in linguistic or conceptual equivalence, in denominative variation (concurrence of synonyms), etc., are all time-consuming tasks. Once the specific problem has been handled, translators do not want to spend more time with research already undertaken in the past. Here terminology management becomes a crucial activity, since it enables translators to do the following:

1. search for a given term more efficiently when compared to searching in printed dictionaries and other sources;
2. ensure the reliability of information retrieval, since terminological records are added and edited by translators on the basis of sources they trust and on consultation with experts;
3. check how to use a term in context;
4. deal more efficiently with several languages;
5. store the solutions found for terminological problems to avoid duplicate research and unnecessary rework;
6. record multilingual domain-specific or in-house terms;
7. enlarge the database and then increase productivity during the ongoing translation or in a later translation;
8. systematize terminology;
9. use terminology consistently over the same or similar projects;
10. prevent mistakes, or unsuitable usage of terms in a particular situation;
11. exchange terminological resources with colleagues, institutions, companies, etc.

In summary, the aim in translation-oriented terminology management is to deal quickly and efficiently with terms in two or more languages. Terminology management will help to achieve this, and, in fact, translators have always recorded terminological information for later use. A basic method of storing terminology used to be, or is in some cases still, in a dual or multi-column word list, using text editors and spreadsheets; the first column containing the SL terms and the others with the equivalent terms in one or several target languages (TL). However, this solution is not

structured properly to manage terms, not is it scalable for more terms to be added of for multiple users to share access. A more sophisticated method for managing terminological data has been adopted since the 1980s, as we already mentioned and involves the use of TMSs. Broadly speaking, a TMS is a computer-based information management system for collecting, storing, manipulating, importing, exporting and managing terminological data, which is structured according to particular criteria andusers, and for the purpose of term compilation. It should be designed to allow extensive documentation of the entry. From the translation perspective, this software is not only used with compiled terminology, but also for the import and export of terms, the creation of new entries, and for recording additional terminological information in the entry (contexts, definitions, cross-references, domain, images, etc.).

It should also be pointed out that computer-assisted translation is a complex process consisting of several stages. Managing large translation projects involves a number of phases, and tasks can be grouped into translation and non-translation or, according to the POINTER report,[2] the phases are: pre-translation editing, translation process itself, and post-translation edit phase. This survey indicates the global aim in each of these phases:

> [...] terminological information is required throughout the translation process: during pre-translation editing to *clarify the source language terms*; in the translation process itself to *identify and use target language terms*; and during the post-translation edit phase for *checking the accuracy of target language terms*. [The italics are mine]

Terminology management, like many other tasks in the translation workflow (proofreading, desktop publishing, text processing, project management, etc.), is considered to be a non-translation task, but it cannot be taken for granted by any translator. Next, I will deal with the description of these translation phases focusing on terminology and ICT issues.

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2   POINTER, Proposals for an Operational Infrastructure for Terminology in Europe, a project carried out by terminology specialists in 1995–1996. <http://www.computing.surrey.ac.uk/ai/pointer/ptsurvey.html> accessed 18 October 2010.

4.1   Phase 1: Pre-translation editing

To clarify SL terms, several tasks can be performed in the first phase, but they can be grouped into one, i.e., documentation, used here in a broad sense. This allows translators to acquire knowledge about the different issues of a particular topic, or about lexicographical or terminographical material already published and available in any format. In translation-oriented terminology work, documentation provides sources that will be useful to check the terms in particular communication contexts, and permits verification or contrasting data. At this initial stage, translators need to focus on the text topic and delimit conceptually the area before creating a reference corpus[3] (RC) made up of relevant terminological resources of different kinds that may be useful during translation. For this purpose, as is widely known, the technology that translators use more extensively is the Internet, which has ushered in a new era, and become the primary information resource for professionals in need of information of any kind. Web pages frequently provide direct access to online dictionaries and glossaries, some of them downloadable for local storage and offline viewing.

Compiling an ad hoc corpus may be also useful at this point. However, the compilation can introduce time-consuming tasks into the translation process, so it is necessary to balance the time and effort required to build up a quality ad hoc corpus against the benefits that can be gained by processing and consulting it (Bowker and Pearson 2002).

For this purpose, a concordancer, such as *WordSmith Tools*, *AntConc*, *ConcApp*, and the like, can provide clues to the key words or terms in the ST by creating a monolexical or polilexical wordlist that can be ordered by frequency. Stopword lists will avoid the noise – or irrelevant data – in the list and may help to determine the topic of the texts (*cf.* Vargas 2006).

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3   Note that 'reference corpus' is not used here with the same meaning Corpus Linguistics applied to the term. In Terminology, a this kind of corpus contains lexicographical and terminological resources (dictionaries, databases, data banks, vocabularies, and so on) that are already available and may help terminologists to get mono- multi-lingual, conceptual, linguistic and pragmatic information about terms or to verify them (Cabré 1993).

It can also give translators useful information about the lexical problems they will encounter: unknown terms, terms not compiled in the term base, neonyms, synonyms, abbreviations, etc. The first terms in the list can also serve as seeds – words or word clusters that identify the domain being investigated – not only to compile glossaries already available about the topic on the Web, but also to try to find parallel corpora in the form of memories (in Translation Memory eXchange format, TMX), or as a collection of texts in language A and their translations to one or several languages. Another kind of corpus used in translation is called 'comparable corpora', which consists of 'texts in the languages involved, which share similar criteria of composition, genre, and topic' (Zanettin, 1998: 2). The usefulness of both kinds of corpora in translation was expressed by Laviosa (2002: 104) in the following way:

> Parallel corpora are invaluable resources of information for discovering typical and well established translation equivalents of given terms and expressions, while comparable corpora are particularly useful for discovering the typical co-text of assumed equivalent terms and expressions in the source and target language.

As previously mentioned, parallel corpus may already be available in TMX, an open standard for the exchange of translation memories, so this file type can be imported quickly and easily into a translation memory, whereas parallel texts need a process of alignment, which converts them into what is known as a 'bitext'; then, it will be possible to import this bilingual document into the translation memory to feed it. Provided that the quality of these existing memories and parallel corpora can be positively assessed, this material will undoubtedly be useful for terminology purposes, as the extract of a GPS device translation memory shows (see Table 6).

Entering Coordinates	Introducción de coordenadas
Lane Assist Page	Página Indicación de carriles
Routes Page	Página Rutas
Trip Computer Page	Página Procesador de trayecto
Compass	Brújula
Enabling Fuel Tracking	Activación del seguimiento de combustible
Using Hands-free Calling	Uso de las funciones de manos libres
Pairing Your Devices	Vinculación de dispositivos
Receiving a Call	Recepción de llamadas
Severity Color Code	Código de colores de gravedad
Traffic on Your Route	Tráfico en la ruta
Viewing the Traffic Map	Visualización del mapa de tráfico
Using the Media Players	Uso de reproductores multimedia ...
Using a Wireless Headset	Uso de auriculares inalámbricos

Table 6: A fragment of a GPS translation memory (English-Spanish)

Therefore, compilation of parallel corpora can be a viable solution with regards to terminology detection and extraction.[4] Automatic web file down-loaders may be useful tools for this task, and can be defined as online or offline computer software for bootstrapping specialized corpora from the web. To illustrate the way this software works, we can take as an example the user-friendly and freely-available software named *BootCat front end*. It uses as input a set of seed terms, combines these seeds in random tuples – sequences of *n* seeds – queries a search engine to find web pages that

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4   There are some parallel corpora already available on the Web. Some examples are: OPUS: Search Word Alignment Database (<http://urd.let.rug.nl/tiedeman/ OPUS/lex.php>), European Parliament Proceedings Parallel Corpus 1996–2009 (<http://www.statmt.org/europarl/>), and JRC-Acquis Multilingual Parallel Corpus (<http://langtech.jrc.it/JRC-Acquis.html>), accessed 18 October 2010.

contain the generated tuples and downloads the relevant pages that the search engine hits page points to; then it cleans up the HTML code and converts all compiled texts into one TXT file, thus creating the corpus (*cf.* Baroni et al 2006). It is obvious that this software offers a great number of advantages, although for translation or terminology purposes, this kind of software should probably incorporate some additional features in order to provide both:

1. a preview of the texts found, in order to determine their adequacy for inclusion in the corpus and not only the URLs, since the latter are not always descriptive enough;
2. a keyword extractor that provides the translators with an idea of the content of each document so they have more parameters to decide if a given text should be incorporated into the corpus.

Other tasks to be performed in this pre-translation process have to do with terminology leverage (or term base match scores), and glossaries import. TMs leverage the memory to match and retrieve segments that were previously translated, but term leverage is unfortunately not always included in these systems. The ideal process would involve scanning the terms encountered in the ST and matching them with the ones recorded in the term base, resulting in a new list with all unknown terms. Thus, it would be able to know the terms that may need a more in-depth investigation in advance. With respect to the collection of available machine-readable glossaries, vocabularies, or other terminology applications, the tasks are concerned with the collection and processing to be imported into the term base set up in the translation project. There are clients who provide a list or a database of multilingual in-house terms, but this is not always the case and, as has been previously mentioned, some time should be devoted to search for and find relevant terminological resources. Budin and Wright (1997: 845) called this process *term mining*, which is 'grounded in the efficient use of search engines'. The tasks involved are listed in two groups: online, related to the use of search engines and assessment of results given, and offline, associated with data processing for local storage. On one hand, the online tasks may require:

1. use of an appropriate query syntax to filter results, avoid noise, and consistently yield the most relevant results possible;
2. identification of the relevant pages in order to consult only the best results;
3. consultation of each page which is considered relevant to see the resource offered;
4. assessment of the quality, accuracy and credibility of the resource;
5. study of the structure of the entries to establish their field sequence and to set a pattern;
6. exploration of the technical possibilities of downloading or copying the resource, including legal barriers; and
7. retrieval of the task for local storage.

On the other hand, the offline tasks may involve processing the resource to ready it for the import process by using a word processor or a spreadsheet, and converting it into an importable format in accordance with the TMS being used, unless the resource is already available in a Term Base eXchange (TBX) format, an open, XML-based standard for the exchange of terminological databases. TMs have integrated this format into the import and export features, so the transfer of information from one term base to another among different TMSs has become much easier.

Terminology extraction for translation purposes needs to be mentioned. The integration of term extraction methods into current ICT should be considered as very helpful and, in fact, terminology extraction from a bilingual corpus is probably the most desired function of a term extraction tool, particularly at a time when translation memories and texts with their translation to one or several languages are only a keyboard and a screen away, or can be created by the users themselves through alignment. The ideal software for this purpose would automatically perform a mono- or bilingual terminology candidate identification and extraction from the source text(s) or the parallel corpus, compiled as TMX or converted to a bitext. This functionality does not usually come with TMs and, when available, needs to be purchased separately.

Once the documentation and import processes are completed and translation memory database and term base ready, they should be selected

when setting up the project in TMs. The access to a term base (and to memory databases too) can be local or remote. A local term base is located on your computer or on a local network. However, it is possible to simply publish the database over a server to be accessible in real time by any Internet browser with an established IP address, then it can be used by anyone who has the necessary network (or Internet) and term base access rights. The main differences between both, local and remote, have to do with term base creation, login and access rights, which are controlled by the system administrator. Remote ICTs are becoming very common nowadays, due to the stability and reliability of the Internet, as well as higher speed rates. A server-based term base offers several advantages, as it allows geographically distributed translators to have access to it or other shared applications from any computer connected to the Internet in the world.

TMs can perform several tasks that are run individually or as a sequence.[5] The aim of the initial one is to prepare the source text(s) and involves converting, analyzing and pre-translating the file(s). Pre-translation refers to the automatic translation of segments in the source file(s) by applying translations found and taken from translation memories and term bases. Then, the translation process itself may begin.

4.2 Phase 2: Translation process

During the second phase, the main task is concerned with identification and proper usage of target terms. Here, TMs automatically look up terminology from the associated local or server-based term base(s), compare the current source sentence with the data contained in it/them, and suggest terms as documents are being translated. Translators can manually perform a search in the term base and insert the equivalent into the active segment.

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5   In this paper, the computer-assisted translation procedure will be illustrated according to some of the most widely-used commercial and powerful TMS, i.e., SDL Trados Studio 2009 and Transit NXT.

Concerning the usability of a terminology management system, the search function is of key importance. Multiple types of searching functions are nowadays available in TMS. Apart from simple searches to locate specific terms, it is generally possible to perform a wildcard search, i.e., by using placeholders (such as * or ?) for unspecified characters in the search, fuzzy searches – the term base will find terms that are similar to the search value, so it is possible to find a term even if the translator is unsure of its correct spelling. Full text search may also be possible, that is, the search value is located in all text fields of each database entry in any language.

Creating filters is another way to perform searches, especially when the terminology collections are very extensive, and the search is not term-oriented but field- or condition-oriented (e.g. when the translator wishes to retrieve all terms that have images or synonyms). A system in which filter criteria can be combined using operators goes one step further.

Searching for term equivalents on the Web is a new feature integrated within the editor of Transit NXT. This option has several advantages bearing in mind the time translators devote to searching in different dictionaries and resources on the web during translation itself. As a built-in module (called 'Web search window'), the searches are performed with no requirement to leave the TM editor and by means of only one action, like a meta-search engine, since it searches for a term (in source or target language) throughout several web-based multilingual resources that are preset by default. The results for the respective web-based resource are shown in the right-hand portion of the Web search window. This new feature enables translators to save time and effort, so it should be included in all TMs.

Throughout the translation process, new terms can be added to the term base, either by selecting both the original term and its equivalent and automatically send the pair to the term base or by manual data entry. When the translator wishes to study a term record in more detail, it is possible to switch between the editor module and the terminology management module.

Finally, proper usage of a term may be checked by way of a concordance search in the translation memory, provided it is fed with previous translation units that contain the term or expression that has been searched for. This feature searches the translation memory for a particular word,

word sequence or phrase. If the TM finds translation units containing the searched for word or phrase, the translator will be able to see the way they were previously translated. This can be done by selecting some text in a source language segment and/or some text in a target language segment.

4.3   *Phase 3: Post-translation edit phase*

Once the previous process is finished, reviewing and spell checking are standard quality assurance (QA) tasks performed on the target texts internally. The target text will then be edited and proofread by the translators themselves; or externally, by a third party commissioned by the client.

Concerning terminology-related issues, this last phase aims to check the accuracy of target terms. TMs also have features for terminology verification and translators can specify what checks should be run as part of this process. These systems run some testing procedure to ensure that the target terms in the term base have been used in the translation and to detect if target terms, marked by the users as forbidden, have been employed.

Spell-checking can also be run automatically. This is a very important terminology task as well, since misspellings may result in a term retrieval problem; the software will not be able to automatically identify and match automatically the term in the active segment with the wrongly spelled one contained in the term base. Needless to say that every correction, change, additional information or improvement should be registered in the TMS to avoid reproducing a mistake or error when using the term base for a future translation.

5. Some future prospects for translation-oriented terminology

Even at the risk of making some mistakes, especially bearing in mind that the ICT industry is quite unpredictable, due to the fact that social demands may determine the course of technological developments, I will try to examine some paths through which, in my opinion, translation-oriented terminology software could progress.

Concerning a terminological workstation, in 1989 Auger was already able to foresee what software developments were going to take place and be implemented for the benefit of terminologists (quoted in Cabré 1998: 160):

> In a futuristic scenario, terminologists will have access to huge data (or knowledge) banks; (…) they will classify, choose, merge and edit data bases reducing their intervention to a minimum. Their work station (…) equipped with advanced and intelligent office tools, will allow them to control, by themselves and throughout the whole process, the elaboration of their product and carry it under the best conditions.

More than twenty years later, we can see that the introduction of computer tools in translators' and terminologists' workstations has changed the methodology of translation and terminology production completely. As foretold by Cabré (2007: 105), integral workstations were going to have a leading role in terminology work scenario. This is a fact nowadays, and we can find some examples[6] of management systems which include modules for carrying out all the tasks involved in terminology work: corpus compilation and processing, term extraction and elaboration and editing of glossaries. The next thing that should be implemented in these terminology workstations is the integration of a Translation Memory in the system, and other features suited to the terminology work carried out within a translation project.

6   See, for example, *Terminus Station*, by IULA, Pompeu Fabra University (<http://melot.upf.edu/Terminus2009/>), and *Corpógrafo*, by Linguateca (<http://www.linguateca.pt/corpografo/>).

During the last decade, the ICT industry has experienced a continuous surge together with the worldwide web, which has gone a step further to become what is known as the Social Web (or Web 2.0), a more dynamic web that has greatly contributed to collaboration between people and to the appearance of new forms of knowledge exchange and social interaction. Other web concepts are the Semantic Web (or Web 3.0), and the Ubiquitous Web (Web 4.0), which pays particular attention to 'technologies to enable Web access for anyone, anywhere, anytime, using any device'.[7] From this last web concept, some new ones have developed, such as cloud computing and collaborative software. The first one refers to 'both the applications delivered as services over the Internet and the hardware and systems software in the data centers that provide those services' (Armbrust et al. 2010). Collaborative software can be defined as software which enables concurrent users who may be geographically distributed to work on a common project Therefore, it is possible for almost any task to be done via the computer and over the web. Cloud-based SaaS (software as a service) translation environments and collaborative workstations for translation have recently been made available on the market, such as *Lingotek's Collaborative Translation Platform* and *XMT Cloud*. The collaborative translation platforms allow multiple translators and others to work on a single document at the same time while keeping track of the whole process.

Within this context, the term 'collaborative terminology' may be used in a similar way to that of 'collaborative translation'. In this type of translation, two or more people work together on the translation of the same ST; both the construction of meaning and the production of the target texts emerge as a result of an individual translator's cognitive process, but supported by the constructive interaction among the team members, which results in a case of optimized synergy. In collaborative terminology, two or more people would be involved in the elaboration or editing of the same term record, which will also result from an individual terminologist's cognitive process, but supported by cooperative interaction among colleagues, domain specialists, multilingual experts, and so on. Actually, the interaction and cooperation with other colleagues, experts, translators, linguists, etc.,

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7   Taken from <http://www.w3.org/UbiWeb/> accessed 18 October 2010

is not new in terminology work. What is new is both the incorporation of collaborative software in workstations and volunteers, staff, bilinguals, professional reviewers pooling their special skills or knowledge built up from experience, training, or study, to create content more dynamically. The possibility to submit content by volunteers is already being offered by online dictionaries, like MacMillan, which has an application for adding new words.[8] Moreover, a validation or quality assurance process is not difficult to implement on a web-based system.

The development of a greater collaborative consciousness and the use of collaborative translation platforms could one day contribute to all of the following:

- globalization and internationalization of translation memories and term bases;
- simultaneous publication of bi- or multilingual content;
- development of new forms of work organization and of simpler procedures;
- real integration of multidisciplinary groups (experts, linguists, translators, reviewers, terminologists, etc.) working at the same time on/within a translation or terminology project;
- more active collaboration with clients and colleagues;
- tasks traditionally done individually will be shared;
- increase of visibility of translators and terminologists on the web;
- discovery of new needs that IT will have to satisfy;
- appearance of new systems that integrate all the tools needed in only one environment;
- less time and effort required for carrying out certain tasks;
- increase of productivity;
- achievement of synergistic solutions and shared benefits for all those involved in a group.

8   See <http://www.macmillandictionary.com/open-dictionary/submit.html> accessed 20 January 2011.

Next-generation CAT tools will deal with online workflows and collaborative translation and terminology. According to what is currently hinted at in translation technology webpages and tweets, the near future scenario will be characterized by two key elements: collaborative work and the Web. We will witness an increase and consolidation of web-based applications, browser-based CAT tools and terminology management systems, interfaces between translators' tools and authoring systems and ways for collaborative translation and terminology work.

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