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Translation, from Pen-and-Paper to Computer-Assisted Tools (CAT Tools) and Machine Translation (MT) †

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Abstract: This paper reflects the technology-induced novelty of translation, which is perceived as a bridge between languages and cultures. We debate the extent to which the translation process maintains its specificity in the light of the new technology-enhanced working methods ensured by a large variety of Computer-Assisted Translation (CAT) and Machine Translation (MT) tools that aim to enhance the process, which includes the translation itself, the translator, the translation project manager, the linguist, the terminologist, the reviewer, and the client. This paper also hints at the topic from the perspective of the translation teacher, who needs to provide students with transversal competencies that are suitable for the digital area, supported by the ability to tackle Cloud-based translation tools, in view of Industry 4.0 requirements.

Keywords: translation process; CAT tools; machine translation; communication; applied linguistics

1. Technology and Translation

The aim of the present paper lies in emphasising the necessity of adaptation to the intrinsic novelty imposed by the actual trend in the evolution of the world, brought about by the development of technology in all the arenas of human activity. Just like the industrial revolutions which preceded it, the fourth Industrial Revolution (commonly referred to as Industry 4.0) goes beyond the industry domain, affecting all spheres of human life. Theoreticians of the concept broadly define the specifics of Industry 4.0 as a fusion of technologies affecting all human activities, connecting the physical, digital, and biological levels. Since translation is perceived as a bridge between languages and cultures, it was only a matter of time until technology-induced novelty influenced the way in which we perform the sophisticated act of rendering words from one language to the other. Thus, we debate the extent to which the translation process still manages to maintain its specificity and particularity in light of the new technology-enhanced working methods ensured by a large (already) and increasing variety of CAT tools (computer assisted/aided translation) and MTs tools (machine translation) that aim to free-flow the entire process of translation, which includes the translation itself, the translator, the translation project manager, the linguist, the terminologist, the reviewer, and the end client. The approach of the author aims to link the use of technology in performing translations nowadays to the greater, more comprehensive phenomenon which we call Industry 4.0, which—although it started as an industrial concept—has now grown to influence every human endeavour. The paper will also hint at the topic from the point of view of the translation teacher, who needs to provide students with the necessary transversal skills and competences that are suitable for the digital area, supported by the ability to tackle the Cloud-based translation tools and software, in view of Industry 4.0 requirements.

The use of technology in translation teaching and, by extrapolation, the use of technology in education is one of the essential features characterizing Industry 4.0. The modern approach in performing translations implies the use of the same technologies and concepts which lie at the foundation of what Industry 4.0 stands for. The use of CAT tools is equivalent to the use of Big Data, artificial intelligence, automation, and digitalization. Moreover, by using CAT tools in the translation classroom, other major requirements of Industry 4.0 are met: the use of technology as a didactic means, the development of students' digital skills, and the integration of various technologies into the normal teaching flow as a basic ingredient.

The importance of translation in a (metaphorically speaking) 'post-Babel world' is already an understatement. The specialised literature on the topic consists of hundreds and thousands of pages, from the earliest over-2000-years-old approaches, attributed to Saint Jerome, acknowledged as the patron of translators, to contributions closer to our times, including those signed by Mona Baker, Roger T. Bell, Susan Bassnett, Umberto Eco, Eugene Nida, and George Steiner, to name only a few. Regardless of their preoccupations and approaches to translation studies—aiming to establish the relationship between word and meaning, the rapport among languages, the (im)possibility to express the intended message in the language of the Other, the precarity of the coding-decoding-recoding of the message, the fidelity towards the original, and the extent to which a translation is prone to lose and win (with)in the process—one of the coordinates that all seem to have agreed upon lies in the fact that translation is an important ingredient in the communication process. Translation enables the so-called cultural bridge, which empowers a perpetual communion of aesthetic values, a communication of the aesthetic identification factor among languages, and also the cognition and recognition of the universal in every language, contributing to the particularisation of a certain language in the general linguistic context, and to linguistic 'globalisation', as we stated in a book published in 2011 [1] (p. 45). In the same book, we read Titela Vîlceanu's opinion regarding the idea that translation appears to be a trans-cultural phenomenon enabling communication that goes beyond any territorial, linguistic, or cultural boundaries [2] (p. 91).

As we belong to a generation that learned how to type on an old typing machine before laying hands on a personal computer, it is only reasonable that we might understand the impact of technology to a greater extent than the generations that followed, who are often referred to as being 'digital-native'. Needless to say, former generations started their education with pen(cil) in hand to scribble on paper, which is still the start today; however, the jump towards the technology-enhanced devices seems to be happening sooner and quicker, and this is applicable to all fields of human activity, including translation, witnessing the evolution from pen-and-paper translation, or even PRAT (Pencil and rubber-assisted translation) [3] (p. 102), to MT and to the more sophisticated CAT tools.

In a broad and simplistic approach to the matter, one could endorse the idea that words were masterfully used and crafted by people first orally, then in (some sort of) writing. We might apply this to the production of original material, and to translation. Irrespective of this, as stated by Kingscott [4] (p.14), in past times, authors and translators would produce their work by hand, first writing a draft, then rewriting it. The portable typewriter came next, followed by the dictating machine as the next technological step, and it was adopted by in-house translation services.

2. On CAT Tools and MT

The present article aims to raise the awareness of the presence and impact of technology upon the translation process, which is expanded to the idea that translation as a process manages not only to survive but also to blossom due to the input of technology. In order to achieve that, one should understand that the two main terms we are describing here, namely MT and CAT tools, are not to be confused or considered to refer to the same reality.

In her online course 'Trends and Reality in Translation Technology' [5], Emmanouela Patiniotaki regards the issue of translation technology as one that considers that all applications and software used by the translator in order to perform a translation project contain translation memories, glossaries,

terminology databases, terminology extraction tools, translation editors, machine translation, alignment, reference management, quality assurance, and review tools. The same author rightfully draws attention to the common misconceptions met in the matter, i.e., those which consider that Translation Technology only implies MT, or that Translation Technology is only intended for technical translation.

We read, in an online article [6], how Jemimah Rodriguez attempts to clarify the difference between the two terms; thus, we are aware of the fact that Computer-Assisted Translation software is a tool which helps translators to translate a text in the languages they work with. It may often be confused with machine translation, which only refers to feeding the text that gets translated without any human involvement. However, what CAT software does is to aid human translators in their translation of a text and saves that text into a database, which is known as Translation Memory (TM). Therefore, CAT tools help in the process of translating. This could be compared to a spell checker in word processing software, which ensures that the spellings in the content are correct. This type of CAT software facilitates the translation of documents without turning the translation process into an entirely automatic one, as Google Translate and other such machine translation tools might do.

Thus, according to A. Imre [3] (p. 210), MT is considered to be that procedure which stands behind analysis performed by an activated computer programme upon the source text in order to generate a target text without the intervention of the human translator. In his book, C.K. Quah [7] (p. 6) also admits that this was the initial goal of machine translation, i.e., to build a completely automatic high-quality translation machine that did not necessitate any human intervention. Nonetheless, in 1952, Bar-Hillel stated that this would be impractical and essentially unattainable.

We understand that MT was initially produced in order to automatise the translation process, as this process was, up to a certain extent, considered intuitive, repetitive, and mechanical, so much so that it was considered prone to customised matching, which may have resulted from possible equivalences between languages. The problems, of course, appeared the minute the language combination was not supported by the desired equivalence, which is often the case. Therefore, even if the rationale behind MT appears to be the simplification of the translation process in the case of formal or formulaic languages, by using artificial intelligence, still, human intervention cannot be substituted by any machine. Thus, it is the translator who needs to give the final touch to the machine-performed action in order to ensure the desired results.

Nevertheless, the subject of MT is a fascinating topic, since it aids the work of the human. That is why even the terminology on the matter seems to be rather generous: as shown in C.K Quah [7] (p. 6), the terms commonly used to describe translation tools in the field of translation technology are:

- machine translation (MT);
- machine-aided/assisted human translation (MAHT);
- human-aided/assisted machine translation (HAMT);
- computer-aided/assisted translation (CAT);
- machine-aided/assisted translation (MAT);
- fully automatic high-quality (machine) translation (FAHQT/FAHQMT).

It is evident that the distinctions between some of these terms are not always clear-cut, as we have already seen, but in order to maintain some order, specialists use the generic term 'machine translation (MT)' when referring to this issue. Some of the MT engines that are available now online are Google Translate, Babylon, Omniscien Technologies, Tauyou, Microsoft Translator, Kantan, CrossLang, Amplexor, Lingo24, Oneliner, Lionbridge GeoFluent, Systran, and DeepL.

On the other hand, 'Computer-aided translation' tools—with the variation 'Computer-assisted translation tools' (CAT tools)—seem to be more commonly used among professional translators. Since the topic at hand seems to have been amongst the preoccupation of the specialists in the field of translation technology, the terms used to explain the tools might appear to be rather complicated. These are tools that—just as their name suggests—assist/aid the translators in their job, i.e., the CAT tools segment and parse the text in the source language, which is fed into the software together with

other reference files, if they are necessary or relevant for the translation job; the variants offered to and decided upon by the translators are recorded as translation memories (TM), thus creating the translation database glossary (TB), to be later used by the translators in their future jobs. The more they translate, the larger the TM and TB. Needless to say, this entire process may seem sophisticated, and indeed, it takes time, practice, and patience to learn the rules of the game, but it is a rewarding, as well as a necessary procedure: the modern and up-to-date translator needs to adapt their approach to the new trends in translation and become much more than a mere carrier of meaning from one language to the other.

The current acceptance of the term 'translator' should also include the other tasks he/she needs to perform as a professional: besides that of a gifted and resourceful linguist, he/she also needs to have some knowledge in the field of computer software, in order to be able to deal with the CAT tools in the field of project management, in order to be able to manage his/her translation projects in the field of communication, so as to efficiently run the projects, etc. Out of the multi-layered facets incumbent upon the translation profession, our attention now focuses on the skills and competences from the computer software area. As we stated in an article, B.-O. Han [8] (p. 324), translators find themselves in a situation in which they need to adapt their work to the new tendencies in the field, being aware that this is the future, and that their survival, productivity, and efficiency in the translation market depends on their power of adaptation.

Our intention is not to suggest, or even imply, that the CAT tools perform the translator's job instead of translators. As we underlined in the same article [8] (p. 325), these tools should be understood, handled, and applied with caution in order to support the job of a translator in being achieved faster when facing, for instance, repetitive terms or terminology belonging to specialised fields. Some of the CAT tools that are already on the market are free, some others are not; some are more user-friendly and intuitive, while the others require more involvement on the part of the handler. This could be compared to the way in which one learns the steps of a new game and copes with the idea that, regardless of how one feels about it, evolution in this field is imminent.

According to an online article [9], the software programmes used in the context of translation are intended to hasten the translation process and ensure its efficiency. These programmes help to edit and store translations, translate projects segment by segment (while keeping their formatting), and ensure quality control (equivalence, consistency, spelling, etc.). Additionally, they help in simplifying terminology management, i.e., one can create, access, and use terms and translation memories while working on projects. The article also underlined the differences between MT and CAT tools: while CAT tools help translators to streamline their translation processes, without actually doing any of the translations instead of or for them, machine translation tools use artificial intelligence to translate texts directly. Nevertheless, translation software tools provide the same goal: to assist in and speed up the process of translation.

The CAT tools market has developed intensively lately, and it takes the form of a large variety of software. As such, there are translation software tools that can be downloaded on a PC desktop and used offline, and there are the cloud-based tools that allow the translator to work online. Furthermore, the variety extends to the market options regarding free or paid computer software; therefore, they are adapted to match different circumstances and needs.

When dealing with desktop (or offline) translation software, the advantages lie in the fact that they can be accessed without an internet connection, and that they work just as well as the computer they are installed on. The drawback to using them would be that they use space on a PC when they are installed, and can be used only on that particular PC. Some of the most well-known such pieces of translation software are: SDL Trados Studio, memoQ, Wordfast (Classic & Pro), Memsource (desktop), Déjà Vu, and Across (among the paid-for examples), and OmegaT and CafeTran Espresso (among the free examples).

The next generation of translation software is represented by Cloud-based translation tools, which are programmes accessed and used online through a web browser. There are many advantages

to using them, since they do not need to be installed on a PC, can be accessed on any device with an Internet connection, save translation in real time and do not lose data, and are updated and debugged frequently and immediately. On the other hand, as the Internet is prone to being hacked, this type of translation software stands at a certain risk. Some of the most well-known such pieces of translation software are: Memsource (cloud-based), Wordbee, and XTM Cloud (among the paid-for examples) and Smartcat, MateCat, and Wordfast Anywhere (among the free examples).

Consequently, we observe that the translation software market is already fairly dense, and—judging by the way technology evolves—it is liable to become more populated. This is a natural process, and we need to adopt it and adapt to it. From the perspective of the translation teacher, this is 'translated'—pun intended—into the effort of presenting this technology-enhanced reality to our students, the future translators, who need to be made aware of the tools they can use as professionals. Clearly, we ought to understand the benefits and the drawbacks that may result from using such tools, but it goes without saying that the future translators would be incomplete in their professional formation if they were deprived of the knowledge and implicit competences that back such technology-supported tools.

One might rightfully argue that the large number of such tools (and the future development of the ones to follow) would make it impossible for a translator to learn the insights of them all. Fortunately, even if they have a significant number of differences, the reality is that the *modus operandi* is essentially the same. The main features regarding, for instance, the text segmentation, the editor, the translation memory (TM), the translation base (TB) or glossary, and importing and exporting the files (to name just a few), are more or less similar, so that the translator finds the tool rather intuitive.

Wordfast Anywhere is the online version of Wordfast Classic and Pro (the offline CAT tool). Among its advantages are that it is user-friendly and convenient, totally free of charge, and permits cooperation with different users. Its weaknesses are that it is a somewhat slow tool and prone to bugs. Nevertheless, it makes a good tool for beginner translators. Smartcat is one of the quickest-developing web-based software translation options for Language for Specific Purposes translation (LSP), translation agencies, and freelance translators; it permits an unlimited number of users and access to continuously-updated translation memories (TMs), it allows the possibility to upload content in different formats, and it includes high-end terminology management. According to an online article [9], the benefits include the fact that it is free, user-friendly, and comprehensive, ensuring that one can transition from other CAT tools or start using it without any beforehand experience. Moreover, it has its own marketplace to collaborate with other professionals in the field.

Memsource is a paid-for tool that provides a web-based translation editor as well as a desktop one. Despite the fact that some translators might consider that it is short of certain functionalities, and it works slower when involved in larger translation projects, it still has a simple, intuitive and user-friendly editor. Another paid-for cloud-based translation tool is XTM Cloud, a customer-oriented, well-organised, intuitive tool, with a solid support team.

Irrespective of the translation software we choose to use in the translation and translation management process, all of them need to have the following features, as pointed out by Jemimah Rodriguez in an online article [6], in which we read about segmentation as being the feature of a CAT tool which divides the content into several segments, thus simplifying the process of translation; instead of typing the translated text of the similar content once more, the translators can use the content segments from the existing database; next comes memorisation, which regards the situation of the specific content that was translated with the use of CAT tool, content which is memorised as source text into its memory; the next time the same content needs to be translated, the CAT tool offers auto-suggestions and permits translators to translate the text quickly. Another feature regards rectification, according to which translators can visualise both the source text and the translated content, and can rectify the translated content in order to ensure the quality. The centralisation feature of CAT tools allows a different translator to work on the same document, in order to ensure a better collaboration. Last, but not least, the import/export of different file formats feature allows the handling of files in varied formats, according to the clients' requirements.

Unquestionably, the novelty implied by the use of any tool requires a certain amount of time to be dedicated to practice, but this does not exceed the working pattern a translator is used to. A translator's job is challenging and rewarding, including that of the translator of specialised texts, who deals with specific terminology, which is (considered) relatively limited or narrowed down. The multitude of tasks included by the job impose a new trend in the professional formation of the translator. The job of a professional translator no longer implies only the process of rendering words from one language to another, especially if we refer to the complete professional translator, who undertakes all of the jobs, i.e., contacting the client, collaboration with other professionals (linguists, terminologists, reviewers, etc.), thus performing the complex task of the translation project manager. Therefore, one can only embrace the aid offered by specialised software, that, if used appropriately, can only enhance and support the work. As underlined in S. Sachs [10] (p.13), if translators manage to learn how to use the proper translation software, they could benefit greatly from the aid of computers, as these can greatly increase the accuracy of texts. Moreover, computers can count words, guaranteeing accurate bills and saving the translator significant time.

3. Translation Technology into the Classroom

As we have stated all along in our article, the technology-supported and -enhanced approach to our everyday life has already become a part of our activity; therefore, it was only natural that it got to shape the way in which we view and perceive the world, looking through a macro-lens, and the way in which we view education, looking through more specialised, micro-lens. As declared in a previous phase of our article, we are deeply preoccupied with the translation process per say, just as much as we are concerned with the training of our students into becoming good professionals. Our main aims are to raise the awareness of our students regarding translation software, and to provide the students with the necessary transversal skills and competences suitable for the digital area, supported by the ability to tackle the Cloud-based translation tools and software in view of Industry 4.0 requirements. This process was activated when we became aware that the translation market requires knowledge and practice in the software field, and that the traditional approach to teaching translation, if performed exclusively using the pen-and-paper technique, was already becoming obsolete. Consequently, we underwent professional training and benefited from the support of our university—by means of the INTECS (Internaționalizarea Educației și a Cercetării Științiice) project (http://proiect_intecs.upm.ro/ro/home/)—in purchasing the SDL Trados Studio 2015 for Translators software, to be used in teaching our students in the Applied Modern Languages specialisation. This helped us to ensure specific activities and provide our students with a professional approach to the translation process.

4. Conclusions

The translation phenomenon appears to be versatile and sophisticated, adapting to the evolution of the rendering of meaning from one language into another. We owe it to ourselves to keep an open mind, to be ready to adapt, and to be able to adopt novelty in the fields in which we develop our activity. Technology has gained an essential role in our personal and professional environments, imprinting upon the perspective from which we see the world, which is undoubtedly forever technology-marked. From our point of view, education has proven to be an ecosystem which has fortunately managed to adapt to the technology-induced innovation, which enables us to believe that there is hope for a better future. The students we build today, will be able to build tomorrow.

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