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By observing our everyday life, we can easily understand how technology is a part of it and how the process that puts together technology and human beings pervades every single professional field. Generally speaking, the aim of this thesis is to show the importance of human-machine interaction in translation and interpreting and to illustrate the different techniques used as well as the potential ones. In particular, though defending the importance of human skills, which are still inimitable and necessary in these language fields, this thesis intends to demonstrate that in some contexts related to translation and interpreting, technological intervention can offer unprecedented possibilities.

The term "human-machine interaction" covers the many disciplines that have benefited from it over the last twenty years. According to Hewett *et al.* (1992), it is a discipline *per se* that is based on technology applied to information and access to information; designs and creates interactive systems; and studies the interconnection with humans. The type of human-machine interaction discussed in this thesis concerns diamesic translation (DT) and automatic translation (AT), and all the changes that have characterized the world of translation and interpreting over the past decades.

The thesis is divided into three chapters. The first one is devoted to the concept of human-machine interaction. It is an overview of both traditional and modern techniques of interpreting, translation and audiovisual translation. In particular, it emphasizes the application of information technology to the field of translation, which began in 1950 for espionage activities. The studies on this subject were interrupted for many years, because of the publication of the ALPAC (*Automatic Language Processing Advisory Committee*¹) report, which considered such studies as onerous and unnecessary². The computer-aided translation systems known today have been designed around the 1980s and they improved with the evolution of computers that allowed the creation and marketing of specific software. When

¹ The ALPAC was a committee, established in 1964 by the United States government in order to evaluate the progress in computational linguistics in general and machine translation in particular (cfr. PIERCE *ET AL.*, 1966).

²Cfr. RIEDIGER & GALATI, 2012.

talking about assisted and machine translation, it may occur that the two types are confused, but their process of translation is clearly different: the former is completely automatic, the latter needs a professional intervention to do the translation work. Beraldin (2013) states that although assisted and machine translation are two different things, they are part of the core of technological inventions made available to the translation world: over all, Computer Aided Translation (CAT) Tools are an excellent example of coexistence between computers and human translators. The audiovisual translation, recognized by Perego (2005) as the set of linguistic transfer methods that aims to translate the original dialogues of audiovisual products, is the area that has benefited the most from the new technological improvements, remaining an expanding genre because necessarily linked to the ever-changing technology. Among the analyzed techniques, there is also respeaking, which uses Automatic Speech Recognition (ASR) systems to transcribe an oral speech through a professional, who dictates the words heard in real time to the software³.

Following the recent projects on interlinguistic real-time subtitling and the introduction into the market of the "Text on top" (ToT) system, which allows to work in a simplified manner during the process of real-time subtitling, the second chapter presents more specifically the technological evolution in the field of translation and interpreting. The projects described (VOICE, SUMAT, SAVAS, EU Bridge) have been developed in order to make the information provided to the deaf and hard of hearing accessible, especially in the academic and workplace. ToT is installed in a USB wireless key, which allows to subtitle a speech in real-time: the subtitled text (both intra-linguistically and inter-linguistically thanks to Google Translate) appears on top of the speaker's screen without interfering with the ongoing presentation⁴. Speakers make their speech talking in the language they prefer. Simultaneously, a real-time subtitler transcribes it. ToT technology allows to send these intralingual subtitles to Google Translate, which automatically translates them in real time in several languages. Then, every single version is sent to several devices connected to a USB key connected to the subtitler's computer. From these devices users can view the AT in the language they wish⁵.

The third chapter, the core of the paper, presents the results of an experiment. This experiment is the analysis of an English text translated simultaneously into several languages by machine translation, thanks to ToT and Google Translate. The analyzed text is the English speech by Tibor Varga and Katalin Varga about the current state of typing in

³ Cfr. EUGENI (2006).

⁴ Cfr. www.intersteno2015.org/

⁵ Cfr. www.text-on-top.com/en/what-is-text-on-top/

Hungary, at the fiftieth Intersteno Congress⁶ in Budapest, on July 2015. The speech was transcribed in English, translated in ten languages, and then sent to the various portable devices used by the audience in real time. The analysis is focused on the machine translations of this text in French and Italian. It is divided into two parts. The first conceptual analysis presents the four versions of the text (original speech, its transcription, French translation and Italian translation) divided into idea units; whereas the second quantitative analysis shows the differences (corrections and mistakes) between the source text and translations. During the process, two main macro categories have been identified: the first one concerning those translations which allow for a total or partial understanding of the source text; the second, which instead contains misleading translations (identified with letter S). Within the macro category of acceptable translations, two subcategories have been highlighted: those grammatically and logically well translated (identified with letter P) and those only partially correctly translated, but still understandable (identified with letter G). It is also important to point out that within the three categories we found different examples that make the sentences more or less correct and more or less wrong: for this reason, different levels of P, G and S have been considered. Focusing on some examples of semantically incorrect translations, a number of strategies designed to produce a source text (in this case, in English) are also proposed. By simplifying the structure of the sentence or by changing some words with others or by adjusting the punctuation marks, it was possible to create a text suitable to be automatically translated into the other two analyzed languages, French and Italian, thus avoiding the mistakes in which it is more common to incur while using AT systems.

Concerning the results, 33% of P, 44% of G and 23% of S sentences characterize the French translation whereas 34% of P, 49% of G and 17% of S sentences the Italian one. The most common mistakes emerged from the analysis are caused mainly by the polysemy of English words in their corresponding French and Italian terms. Another example is the grammar shift of an element from the source sentence to the translated one (i.e. "adjective + subject noun" becomes "verb + indirect object"). Furthermore, it became clear that S units are not necessarily long and complex sentences: this means that the problem does not lie in the grammar intricacy of idea units, but in the way the software infers and then translates sentence components. Also word-for-word translation is a well-known obstacle to the

⁶ Intersteno is an NGO recognized by the UN and existing since 1887. Its current name is *the International Federation for the treatment of information and communication*. All the Congress from the Second World War onwards have hosted championships fast writing with the most varied techniques, following constantly updated regulations to allow a fair evaluation of competitors who use different languages.

translation result: a high number of elements translated literally create a text which is difficult to read and understand, since the meaning of the original sentence, or at least its colour, is partly changed or completely lost. Despite the above-mentioned mistakes, the analytical work has shown satisfactory results in terms of translation quality in both French and Italian versions. In fact, the translations as a whole are comprehensible, although in both cases, G sentences are predominant, with grammatically incorrect, but still understandable units. The sentences correctly translated represent in both texts a significant percentage: in fact, the analysis has enabled to highlight how the capabilities of the world's most used machine translation software has improved in recent years, making the creation of an almost correct translation easier. Of course, human skills remain fundamental in this field, especially to get the exact translation of idiomatic expressions and the pragmatic aspects of a source text, which emerge not only from a linguistic study, but also from a cultural one. Nonetheless, AT allows translators to save time and effort, especially if it is used in professional contexts or during conferences where the audience is an expert in the field of the discussion. In these cases, users will be able to guess the meaning of an S sentence thanks to co-text, context, and their background knowledge.

This thesis ends with reflections on pros and cons of AT systems. By doing so, emphasis was put on the differences between machine and human translation and on the fear of translators to be replaced by a machine: this disappears when one realizes that the adaptation to technological changes invading the world of translation is necessary and useful. A change in the mind of professionals is, however, needed so as not to see AT as something that automathizes the profession, but as a process to be integrated in today's digital environment.

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