

Technological Trends in Translation and Interlingual Communication Throughout the 21st Century

الاتجاهات التكنولوجية في الترجمة والتواصل بين اللغات خلال القرن الواحد والعشرون

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Abstract:

Since the outbreak of World War II and USA rush to spy on Russian vessels, industrial translation has been evolving at a breakneck speed so as to cross the communication barrier between nations. On this journey, one thing becomes clear: diverse technologies have emerged that in turn have increased productivity and quality in translation. In fact, innovative technological solutions to the age-old problem of the language barrier is an absolute must as human and international communication is progressively mediated through technology like smartphone applications and professional business communication platforms. Despite the fact the translation market offers now more options, only a limited number of technology trends will undoubtedly continue through 2021 and beyond. In other words, computer-assisted translation tools and machine translation seem to be the most dominant trends. However, these tools also represent significant challenges and uncertainties for the translation profession and the industry.

Key words: Translation, multilingualism, communication, technology, machine translation.

1.Introduction:

Technology has always shaped the way societies and people alike behave not only within themselves but also their relationship to each other. The last century has remarkably witnessed an explosion in communication technology with the advent of the internet and mobile devices such as smartphones, tablet computers, mobile gaming systems, etc. Such aforementioned technology have radically altered the way people interact with each other and have generated new communication modes in the form of telecommunications and networking. Mobile devices, often easy-to-carry, and the wide availability of Internet now make it possible for people to be in close contact wherever they are on earth. It is not uncommon for people to prefer texting instead of actually meeting, or at the very least, calling and thus hearing another human voice. Skype, FaceTime, Facebook Messenger Calls, Viber Calls, and WhatsApp calls all give people robust capabilities to utilize the Internet as a platform for global communication. Additionally, social media, forums, and the interactive Web 2.0 allow people from all over the world to connect, meet, and learn together over a digital medium.

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The novel coronavirus pandemic has further affected even casual face to face communication. During the mandatory quarantine, an unprecedented quick shift towards virtual communication has gained momentum almost all over the globe. In fact, Tim Levine (cited in Taunton) explains how the novel coronavirus pandemic has affected the way we communicate, “We have less interaction overall with people ... we live with, and we spend more time on Zoom, Skype and other mediated platforms.” Instant communication via technology also translates into the business world. It is not uncommon for global companies to interview clients or prospective personnel using applications. Furthermore, challenged with the lack of the resources or time to speak to customers directly, corporations have resorted to automated communications. 75% of all companies now use automation tools. Another recent trend is the growth and widespread adoption of video conferencing technology. Approximately six in ten Americans use video chat platforms for social or work purposes (Patel). Last but not least, the rapid growth of e-commerce has pushed content production on the internet in diverse languages. While technology has helped to bridge a global gap by connecting people via the digital world, those who are physically close together are often far apart due to their inability to speak the same language. The application of technology has been also stretched to the translating activity which has been enhanced by a wide range of tools.

2. Brief History of Translation Technology

Machine translation, in simple terms, is the automated translation of a source-language text into a target-language text. Human translators may be involved at pre-editing or post-editing stages; that is to say, at the beginning or the end, but they are not typically involved in the translation process. The history of translation technology is quite short if ever compared to other sciences, yet its development has been incredibly fast indeed. Early attempts dated back to the 17th century with the use of mechanical dictionaries. The very first proposals of unmanned translations emerged in 1933 by George Artsrouni and Petr Smirnov Troyanskii. In other words, Artsrouni design was a storage paper tape device used to retrieve synonyms for words in the target language. The proposal by Troyanskii was a machine composed of cards in different languages, a typewriter and film camera, for the selection and printing of words when translating from one language to another (Hutchins, 433).

It was at the beginning of the Cold War the possibility of using computers for translation was first discussed by Warren Weaver and Andrew D. Booth. US-government-funded research stimulated international interest in the investigation and production of machine translation systems. The original intention was to produce a fully automatic high quality machine translation system. In 1954, a collaboration between IBM and Georgetown University culminated in translating an extremely limited vocabulary range, around 250 words, plus six rules of syntax, from Russian to English (Brooks). Despite the early confidence in machine translation, the US Automatic Language Processing Advisory Committee (ALPAC) reported that machine translation was essentially not worth the trouble nor expense. It further recommended resources ought to be invested instead on automated tools such as dictionaries to support human translators in their work (Brooks). The ALPAC report was detrimental on American pursuit to perfect machine translation for almost the next decade leaving the podium for other countries and private enterprises.

The first generation of machine translation, based merely on direct translation approach by matching the source language to the target language word for word, yield poor results except if applied within specific language domains such as the *Météo*

system, developed in Canada in 1976 to translate weather forecasts between French and English, were successful (Jones). Dissatisfaction with the outcomes fueled further research and innovation. By the 1970s came the second generation of machine translation, based on interlingua translation approach. In other words, the source text is first analyzed and then converted into a special interlingual language. Afterwards, the target language is generated from this intermediary form (Jones). However, this innovation constituted another setback, for the system could not account for ‘all’ possible aspects of syntax and semantics for all known languages” (Quah, 2006, p.73 cited in Jones).

The early 1980 marked the start of a different generation of machine translation based on the transfer approach. In other words, the text, in the source language is first analysed by a source language dictionary and converted into an abstract form which is translated further into another abstract form in the target language by means of a bilingual dictionary. Eventually the target abstract form is rendered into a target text using a target language dictionary. However, problems persist with solving ambiguities which in turn highlighted the need to update dictionaries to embody huge amounts of information to sort out all types of ambiguities, idiomatic expression and anaphora across a wide range of languages. In the 1990, the third generation of translation system, based on statistical and example based approaches, gained momentum. It also marked the preliminary start of translation memory tools. The system first breaks the source text down into segments. Each segment is then compared to a pool of bilingual corpus. The most appropriate translation is then picked up based rather on statistical evidence and distortion probabilities. The example-based approach is founded on process of extracting and selecting equivalent phrases or word groups from a databank of parallel bilingual texts.

Recent developments have seen the incorporation of deep learning and neural networks to solve the old-age problem of accuracy, with a tough race of the big tech giants like Google, Apple, Microsoft, and suchlike to compete for larger portions of the industrial translation market over the globe. Google for instance made the big announcement in 2016 about its Google Neural Machine Translation (NMT) system making significant leaps towards more impressive results. The neural network is loosely modelled on the way the human brain functions, with artificial neurons sending signals to other neurons when activated (Brooks). In brief, neural machine translation works by translation whole sentences instead of the old-fashioned mechanism of individual words or word chunks. Almost all neural machine translation models employ the encoder-decoder framework. The encoder-decoder framework consists of four basic components: the embedding layers, the encoder and decoder networks, and the classification layer (Tan et al). Each word in the input sentence is encoded as a number to be translated by the neural network into a resulting sequence of numbers representing the translated target sentence (Yip).

3. Current Status and Future Trends in Machine Translation

1.3. The Biggest Challenges in Machine Translation:

The on-going advance of technology provides exciting new ways how machine translation will operate for the years to come. Despite machine translation performance, in some languages, has reached human translation quality, there persist problems that in turn curb the effort of machine translation ultimately replacing either human or computer aided translation. By now, the view that fully automated high quality translation is still impossible and translators’ mandatory intervention at both the pre- and post-editing still reflect the current industrial translation landscape (Hutchins). In fact, there still persist old-age pitfalls. First, the capability of correction

is still quite limited, for machine translation technology has not progressed to pause-and-repeat function to allow a machine to go over a phrase more than once, then accurately translate it. Furthermore, the wide range of nuances such as sarcasm and jokes are almost all mistranslated. In other words, machines are very literal and cannot pick up cultural meaning either in the source or target language. Moreover, given the fact automated translation finds the closest equivalent in another language for the translation, it falls behind translating any occurrence of words that do not have their equivalent counterpart in the target language such as specific industry jargon. It should be remembered that the system retrieves information from the data base it has been fed.

2.3. The Biggest Challenges in Neural Machine Translation:

Today despite Neural machine translation (NMT) has emerged as the most promising machine translation approach in recent years, its system is still plagued with failures. NMT systems have lower quality out of domain, to the point that they completely sacrifice adequacy for the sake of fluency (Koehn & Knowles). In other words, NMT produces very fluent outputs unrelated to the input for out-of-domain data. Given the fact that words meaning is not an independent entity, rather the context or domain determines what words stand for, in fact, situational contexts keep changing the same word meaning, yet machine translation still cannot cater and adapt to the variety of language use contexts. So a general MT system like Google Translate will do particularly bad in specialized domains like legal or finance. Hence, a crucial step in developing robust machine translation systems targeted at a specific use case is domain adaptation. Another daunting problem is that increasing amounts of training data lead to better results; however, the reverse holds true too; in other words, low-resource settings generate poor quality. Another known challenge is that translation models perform particularly poorly on rare words, words observed a single time in the training corpus, if compared to translation of very infrequent words. Besides, inflected adjectives and verbs have low accuracy and higher deletion rates than nouns. Another well-known flaw of early NMT models, built on encoder-decoder system, is the inability to encode and generating long sentences. Despite the NMT has been consolidate with attention detection, the problem is far from solved. For instance, it is not uncommon in certain domains such as law to encounter long and complex sentences.

3.3. Translation Trends

The global translation industry is predicted to continue its growth in the years to come, however, these growth trends may look different in different regions of the world. Automated translation, computer-assisted translation, and human translation are the three methods of translation that are predicted to continue to operate, yet it is expected the global machine translation market will have a compound annual growth rate of 19% until 2024. Of course, human translation will not be obsolete in the near future, but we will be seeing more computer-assisted translation (Taylor). Human translation (HT) is still the most trusted for the time being for more than one reason. Only human translation practitioners can comprehend the language complexity including context, colloquialism, and creative writing. Creative writing genres such as novels and marketing materials can be best translated by humans. It is worth noting, translation is not merely content conversion into the target language, rather it also entails domain expertise. That being said, HT also applies to content which requires domain expertise such as medicine, law, or engineering, just to mention but a few. Despite the limitation of machine translation mainly perfect accuracy, it has witnessed excess demand owing

much to the fact only machines can treat large volume of textual data. Computer-assisted translation is translation performed by a human translator with the assistance of digital tools, be it a software, platform or application and suchlike. There remain constant challenges regarding colloquialisms and slang words that cannot be translated or will be mistranslated. Besides, automated translation is fully-machine operated wherein the translation job is performed by software with no actual involvement of any human activity of any sort. However, it does not look all perfect. There is a clear disparity on how such diverse translation trends are evolving around the globe. In Europe, there is an increased growth into the use of machine translation post-editing and artificial intelligence. Besides, E-commerce drives the need for technical and machine translation in North America. However, businesses reliance on machine translation is expected to grow fast due to the need to provide their content, products, and services in as many languages as possible.

One of the most exciting developments in the automated translation domain has been the development of neural machine translation (NMT). The technology uses large quantities of data fed into an artificial neural network to predict the likelihood of a sequence of words, typically modeling the entire sentences in a single integrated model. The model learns by doing, in other words, artificial translation intelligence (Research and Markets). NMT is expected to drive the market growth. This trend is rather a necessity as companies are investing more to develop advanced technologies to meet consumer needs and reach wider audience. There is also emerging evidence that translating with a machine and then refining the result using a post-editing service will gain momentum.

4. Conclusion

From smoke signals to messenger pigeons, human communication has been constantly evolving. Now, digital methods have superseded almost all other forms of communication. The advent of the internet since the mid-1990s have made communication instant through a bunch of brand new applications such as electronic mail, instant messaging, voice over Internet Protocol (VoIP) telephone calls, two-way interactive video calls, discussion forums, blogs, and social networking. Besides, the business sector is no exception. Thanks to growing internet access all over the globe, companies are increasingly availing themselves of the communication revolution to reach a wide audience and ameliorate customer service. Social platforms have also minimized corporate budget dedicated to televised commercials. Despite the world now looks more connected than ever, the linguistic barrier persists as the major challenge in human communication. Innovations in technology have also had far-reaching effect on the translation industry. The use of technology in translation has brought with it important trends that are rapidly changing the translation industry landscape. Some of these trends include machine translation and computer-aided translation tools. This has made the everyday translation process easier and more efficient.

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