Makine Çevirisinin Tarihsel Süreci*

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Öz

İletişim ihtiyacının her geçen gün arttığı küreselleşme çağında, farklı kültürler arasında iletişim kurmak için çeviri hayati önem taşımaktadır. Buna bağlı olarak çeviriye olan talep artmakta, bu da çevirmenler üzerinde bir yük anlamına gelmektedir. Ticari metinlerdeki artan talepler, çeviri projelerindeki hacmi de aynı oranda artırmıştır. Bu kapsamda kendilerini çok daha zaman kısıtlı bir ortamda mesleklerini ifa ederken bulan tercümanlar, teknolojinin mümkün kıldığı yeni alternatifleri de alana entegre etmek durumunda kalmışlardır. Bu noktada çeviribilimin güncel konularından sayılan makine çevirisi (MT; Machine Translation) ve bilgisayar destekli çeviri araçları (BDÇ), çeviri sürecini otomatikleştirerek ve kolaylaştırarak çevirmenlerin üzerindeki bu yükü hafifletmekte ve bu alanın geleceğini şekillendirmedeki önemli rolünü ortaya koymaktadır. MT'nin bu yaygınlığı, ancak birçok zorluğun ardından elde ettiğini de belirtmek gerekir. Bu durum çeviribilimde büyük bir değişim yaratmıştır. Çeviri alanını her ne kadar etkilese de makine çevirisi paylaşılan veri politikası nedeniyle hala açıklanamayan etik sorunlara sahiptir. Bu sistem ile her etkileşim depolanmakta ve başka kullanıcılar tarafından da kullanılabilmektedir. Bunları göz önünde bulundurarak bu makale makine çevirisinin tarihsel gelişimi ile birlikte etik açıdan tartışmasını ortaya koymaktadır.

Anahtar Kelimeler: Çeviribilim; Makine Çevirisi (MT); MT Tarihi, Bilgisayar Destekli Çeviri (BDÇ) Araçları; MT Etiği

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The Evolution of Machine Translation: A Review Study*

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Abstract

In the era of globalization, where an increased need for communication emerges day by day, translation is of vital importance to establish communication among various cultures. Accordingly, there is an increasing demand for translation which also means a burden on translators. With a skyrocketing amount of business and commercial-related translation tasks, the volumes of translation projects have increased to the same extent. Situated in a position where the translators are obliged to terminate the designated project in much more time-restricted schedules, new alternatives brought about by the improvement of technology have happened to be implemented into the translation field. Within this scope, machine translation (MT) and computer-assisted translation (CAT) tools, regarded as the current issues in translation studies, cushion this burden of translation on translators by making the translation process automated and easier, which reveals their significant role in shaping the future of this field. It is also worth mentioning that MT has obtained this prevalence only after many challenges. This situation has created a massive shift in translation studies. However much it affects the field of translation, machine translation still has unexplained ethical issues due to its shared data policy. Each interaction with the system is stored in its database and can be reused by any other users. Considering those, this paper scrutinizes the historical evolution of machine translation as well as its discussion from the ethical aspect.

Keywords:
Translation Studies; Machine Translation (MT); History of MT; Computer-Assisted Translation (CAT) tools; Ethics of MT

* Ethical Statement: * It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.

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Introduction

Machine translation (MT) is one of the popular issues in the translation community. It basically refers to "computerized systems responsible for the production of translations with or without human assistance" (Hutchins, 1995, p. 431). That is to say, it makes use of artificial intelligence and some algorithms to automatically generate translations from one language to another without requiring human intervention. In the words of (Hatim & Munday, 2004, p. 217), ‘‘Machine Translation started out with the hope and expectation that most of the work of translation could be handled by a system which contained all the information we find in a standard paper bilingual dictionary’’. However, the fact that it only offered raw translation turned this system into an extension of computer-assisted translation (CAT) tools which make the translation process structured with their many features mentioned below. Additionally, there are machine-aided human translation (MAHT) and human-aided machine translation (HAMT) systems. They are often considered ambiguous and, consequently, have merged into a single term called computer-assisted translation (CAT), encompassing both systems.

MT and CAT diverge because the core of the above-mentioned systems is MT, which assumes the upper automation of the translation process. To elaborate more, CAT is composed of some tools that are intended to assist human translators in the translation process. Within these tools, translation is generated by the software and presented to the translator with separate segments – a phrase, sentence, or paragraph, and the translator can use the tool for editing, managing, and storing translations. Thus, it is worth mentioning that CAT tools and MT have made the translation process easier and faster. Regarding the advantages of CAT tools, Mohammed, Samed, and Mahdi (2020, pp. 1084-1085) state that CAT tools are consistently employed to disburden and expedite the translation process, offering advantages for both translators and clients. They not only save translators valuable time but also reduce the overall cost of the translation service. However, it appears to be neither puzzling nor surprising that the integration of such a newly-coined and improved term as machine translation into the translation market has caused new discussions to spring up. At the end of the day, the concept of machine translation encapsulates many different stratifications that have remained undiscussed. Given that each budding field brings about new challenges which necessitates to be confronted and resolved, it is of vital importance to address the unresolved questions in the new field. For instance, taken machine translation into account, tapping into the shared data policy which has come to be rarely pronounced till the machine translation evolution, both the professionals and clients seem to have been drawn into a relentless discussion with regard to the ethical aspect of

the process. At the end of the day, MT makes use of a shared data policy formed through previously-handled translation activities by many users, jeopardizing their data. Therefore, some clients tend to demand that machine translation is not used by the professionals assuming their projects. By relying on these, ethical issues regarding machine translation have been discussed in this paper after giving a brief history of MT.

History of Machine Translation

Without any doubt, MT and CAT tools have not immediately gained this popularity and offered the benefits they include. It has taken years and many experiences to reach that position. Though dreamt in the seventeenth century, it was only in the late twentieth that the concept of machine translation materialized (Hutchins, 1995). Leon Dostert (1957), who was one of the prominent scholars that joined in the research project to design a machine translation in Georgetown University states in his article that it was only the last couple of years that the notion of machine translation sparked a rampant interest in the academic circles, prompting a research and improvement to be accelerated. The growing interest within the promising field of machine translation has gained such a traction that it soon has become an interdisciplinary field, in which many professions have collaborated. As Chéragui (2012) notes, "[o]ver the years, Machine Translation has been a focus of investigations by linguists, psychologists, philosophers, computer scientists and engineers" (p. 160). Nonetheless, the background of MT poses some uncertainty due to the lack of reliable sources in this field. As support to this claim, Harold L. Somers (1997, p. 115) alleges that the information available on MT was relatively limited, with pertinent articles found in journals focusing on related or contributing fields such as computational linguistics, translation studies, human-computer interfaces, and software engineering. The scarcity of these articles made it feasible for individuals to stay well-informed on all pertinent content.

The story of MT began in 1933 when Soviet scientist Peter Troyanskii introduced a mechanical translating machine to the Academy of Sciences of the USSR. It was a necessarily simple invention with cards in four different languages, a typewriter, and an old-school film camera, but it was considered useless by the USSR. In the meanwhile, Troyanskii passed away while trying to finish his invention. In 1949, the pioneers of MT, such as Warren Weaver, proposed using computers to translate text by breaking it down into smaller units and processing them systematically. As described by the Hutchins Report, on January 7th, 1954, the Georgetown experiment, the first successful demonstration of MT, was conducted. However, the fact that pilot sentences were deliberately selected and excluded out of any ambiguity was not a spoken

issue. To improve MT, forty years passed with vain struggles. The US ALPAC (Automatic Language Processing Advisory Committee) considered MT expensive, inaccurate, and unpromising. Instead of MT, they suggested working on dictionary development, which resulted in a halt for almost a decade. Consequently, with each development in the MT world, there occurred some approaches based on the periods named after later on:

1. **Rule-based Machine Translation (1950s-1980s)**: In this approach, linguistic rules were used to translate text from one language into another. However, it proved to be highly ineffective due to the complexity of natural languages.
2. **Transfer-based Machine Translation (1980s-1990s)**: This approach used a bilingual dictionary and a set of rules to transfer the meaning from the source language into the target language. It was an improvement compared to the rule-based MT, but it still had limitations.
3. **Interlingual Machine Translation (1990s)**: This approach benefited from an intermediary language (interlingua) that represented the meaning of the source language. It was more effective than transfer-based MT but required extensive manual effort to create an interlingua.
4. **Corpus-based Machine Translation (1990s)**: It included example-based machine translation and statistical machine translation as well as using a parallel corpus to gain new knowledge for future translations.
5. **Example-based Machine Translation (1990s-2000s)**: In this approach, translation was based on similarities between parallel sentences in the source and target languages. It was more effective than the previous approaches but required a large amount of training data.
6. **Statistical Machine Translation (2000s-2010s)**: This approach was based on statistical models using large amounts of bilingual data to translate text. It was a significant improvement compared to earlier approaches and was widely used in industry.
7. **Neural Machine Translation (2010s-present)**: This approach uses deep learning neural networks to translate text. It has shown remarkable improvements in translation quality and has become the most widely used approach in machine translation.
8. **Hybrid Machine Translation (present)**: It combines two or more machine translation approaches, such as rule-based, statistical, and neural machine translation, to improve

> the quality of translations. In hybrid machine translation, each approach handles a specific aspect of the translation process, such as grammar, vocabulary, or context, and the results are combined to produce a more accurate translation. This kind of translation aims to overcome the limitations of individual approaches and provide more reliable and consistent translations, especially for languages with complex grammar and syntax. It is widely used in industry and research and has shown promising results in improving translation quality.

These approaches, respectively given above, present the process of MT in a nutshell. In fact, by relying on the statement related to the lack of sources, the approaches are found to have been classified in accordance with different criteria in several sources. For example, Somers (1997) distinguishes linguistic and corpus-based (analogy-based, example-based) approaches. Likewise, Margaret D. Okpor (2014) mentions two main paradigms: rule-based and corpus-based approaches. Direct, transfer-based, and interlingua machine translation approaches are available within the sub-approaches of the rule-based approach. Statistical machine translation and example-based machine translation are encountered regarding the sub-approaches of the corpus-based approach. Besides, Okpor (2014, p. 164) refers to hybrid machine translation by saying the reason behind the creation of hybrid machine translation systems arises from the inadequacy of individual techniques to attain a desirable level of precision. That is to say, hybrid machine translation can be considered to be a combination of the approaches' efficacious aspects.

Furthermore, MT is mostly applied via CAT tools, as mentioned above. Especially professional translators benefit from the advantages of making the translation process easier, faster, and more systematic. Therefore, MT will be referred to in the progress of the paper by mentioning CAT tools.

Why has the concept of Machine Translation and CAT tools become such an important topic?

It is no secret that the term globalization has affected the translation field more than anything else. As the world has become closer with the countries among which there has formed a link of cooperation ranking from commercial tasks to politics, the experienced language barrier has necessitated being sorted out with the help of language experts. These commercial and business-related documents have challenged translators too much. What is more, the burden in question occurred due to the circulation and speed of the upcoming tasks and the lengthiness of the documents demanded to be translated. Given that globalization has not transpired in a seclusion

but rather in tandem with technological improvement, it might be stated that globalization and technology have contributed equally to the rising burden of the translators (Doherty, 2016). Some of the research has also proved that the number of translation tasks has been constantly rising. For instance, Kučiš (2010), who compared the number of translated documents within two different timelines, explains the phenomena by stating that within the translation market of the European Union alone, there were 1,125,709 pages translated in 1997. By 2007, this figure had increased to 1,762,773 pages, which is likely to have grown further. The rising demand for translation services has led to an increased hiring of freelance translators, indicating that computer-assisted translation (CAT) tools are likely to remain a permanent fixture in this landscape.

Therefore, the translators who have faced an unprecedented flow of translation tasks have needed to possess an aid through which a much more accelerated translation process would be possible. Thus, The life-saver at stake has become known as CAT tools, which basically stand for the applications equipped with several come-in-handy technological traits used by hands-on translators. So much so that, it has become a cardinal necessity for translators to use CAT tools to survive in such a globalized world (Vukolavic, 2021); it is also to be noted that the intensified amount of workload in the translation field appears to be dominated by technical texts. When the demands of the translation market are considered, it is to be seen that the documents demanded to be translated consist of technical and formative texts, in which recurrent and terminological usages are frequent. At this point, two of the most widely utilized traits of the CAT tools appear to come to the forefront: terminology-base and translation memory. Since translators are asked to translate technically written texts, they end up confronting the same usages and terminological words that almost always follow each other. For the texts in the business sectors are generally similar to each other, these traits are nearly the most essential parts of the CAT tools (Craciunescu, 2004). Thus, the operating modern-world translators, in one way or another, end up utilizing CAT tools a lot.

Ethical Aspect of MT and CAT Tools and Shared Data Policy

The reality of MT and CAT tools can be asserted to have added one more layer to the already multi-layered characteristic of the translation field. Due to its nature, the translation field has been ripe enough to harbor many debates crafted by its doers. Both practical and theoretical ideas have been throned and dethroned ever since the dawn of the day when conveying one message from one language into another was made possible. As a field, translation has always been open to ethics-driven discussions, the most well-known ones of which are word-for-word

or sense-for-sense techniques that have come to be discussed ever since Cicero's time. It should be noted that the appearance and skyrocketing usage of MT and CAT tools have come to be evaluated within the scope of ethics, too. When scrutinized under the name of ethics, it ought to be addressed that the usage of these tools causes many ethical problems. Although MT and CAT tools have been examined from several aspects, not much research has been conducted to tackle the situation from the ethical side of it. One of the sporadic studies is the one conducted by Melby and Warner (1995). They point out that for a healthy conversation to crystallize, an agency, which stands for an alive interlocutor actually listening and responding, is necessary. In the words of Melby and Warner (1995, p. 4), for effective communication, it is essential to possess agency, encompassing the ability to make genuine choices for which we assume accountability. Additionally, we must recognize our conversational partners as individuals with the capacity to make choices. They (1995) state that if humans are destitute of agency in their conversations, then the interaction is doomed to spiral into being no more than an artificial and shallow chain of sounds.

Without agency, we are reduced to the status of machines, and there is no dynamic general language (see also Kenny, 2011). Accordingly, as Melby and Warner (1995, p. 7) state the lack of dynamic, versatile language would result in a computer-like approach to translation, eliminating the distinctively human quality in our current understanding of the translation process. Consequently, the lack of agency represents a key factor preventing computers from translating in a manner akin to human capabilities. The moment the agency is stripped away from the grasp of people, the conversations happen to sound not as human as they should be. At this point, it is necessary to remember the previous lines mentioned above. Modern life translation projects are dominated by recurrent usages and terminologies that are often translated by terminology base and translation memory. Since these usages are technical information, machines seem to be entirely accomplished in conducting their translation. However, it also causes the language to be deprived of the needed agency, leading the translated project to seem like a sound in which no human touch has been infused.

Moreover, even though machines seem to be well-versed in technical translation due to their nature of being dominated by technical usages, it may not be inaccurate to assert that the lack of agency is bound to cause lexical problems while conducting texts in which human touches are present. As Kenny (2018, p. 62) puts the idea forward, computers may be come-in-handy in terms of technical fields. Lack of agency, however, sets the limits to the possibility of computers which translate like humans in dynamic and general domains. It also extinguishes

the responsibility of any undesirable action. For example, when a text containing private and personal information is entered into the system to be translated, the machine which lacks agency cannot be responsible for its privacy because it employs a shared data policy. The source and target texts are stored to be used for the future translations. This ethical aspect of the MT and CAT tools appears to be dominated by the reality of shared data policy. In relation to this point, Dorothy Kenny (2011) alleges:

> ‘‘… in other cases where translation memories are shared, or services such as Google Translator Toolkit retain source texts and their translations to assist in the training of the Google Translate SMT system, then significant issues of confidentiality arise (as the texts in question might contain sensitive personal or commercial information, for example). Not only that, but people who reuse translations through Google Translate cannot be sure that those translations have been shared by their rightful owners in the first place, and nor can they acknowledge the anonymous translators whose work they are reusing’’ (p. 126)

It is no secret that MT is generally based on data, which comes to be arranged through innumerable amounts of previously done projects. Each human intervention in the outcome of MT is stored as data in the algorithm. That’s why, ‘‘[d]ata collection is the first and most evident issue when it comes to translation’’ (Mager et al., 2023, p. 4874). The final translation product is ultimately presented to the public without filtering any sensitive data. However, the question of ethics arises when one thinks about the fact that the majority of the clients demand their projects to be translated in secret. Since translators happen to perform the profession with the most access to people's personal data, the clients' demand for their documents to be translated in compliance with confidentiality is reasonable. However, as the translation memory is created through necessary usages extracted from the previously done translations, one needs to ask, "[w]hose data is it that is actually being used?" Thus, when the concept of confidentiality is thought within the realm of data-sharing, several ethical problems arise (Kenny, 2018).

Last but not least, one of the ethical problems caused by the use of MT and CAT tools is the issue of creativity. It is widely known that translation is a creativity-driven profession. Yet, The interfaces of CAT tools happen to be segment-arranged, meaning the sentences are translated segment by segment in an extracted form. Therefore, translators generally end up not being cognizant of the following sentences, leading him/her to be focused on the segment on which they are operating, narrowing their vision. Although the raw translation seems beneficial for the questions of speed and accuracy, the creativity tends to be derailed given that translators'

choices and thoughts are channeled into the already-translated raw translation segment. The study carried out by Dow and Massey (2014, p. 20) revealed that numerous statements from professional translators indicate that language technology tools are unduly limiting their creative autonomy.

The conductor scholars are of the opinion that the segmented nature of the CAT tools constrains the freedom and creativity of the translators to move away from the text (Dow & Massey, 2014). Another author, who analyzed the relationship between creativity and the usage of CAT tools, concluded that the recycling nature of the machines may discourage the new creative forms of utterances (Todorova, 2020). These realities may explain the reasonable fears when using CAT tools becomes the topic for the literary texts.

Conclusion

In conclusion, it can be stated that MT has undergone a number of phases throughout history, each of which has contributed new strategies, notions, and, to some extent, questions to be sorted out, thus leading the concept of MT and CAT tools to be ameliorated. When all these phases combined are scrutinized, it is highly likely to perceive that each new phase has opened a road to transform the more manual usage of MT and CAT tools into a more auto-generated one, which can easily be characterized as much more technology-driven.

Furthermore, the concept of CAT tools has apparently gained solid ground within the field of translation owing to the warranted reasons brought about by the modern world. Among these reasons, the globalization of the world (companies), which has caused lengthier documents and projects to be translated, can be deemed as the driving force for improving MT and CAT tools. The more the world has become closer and more globalized, the more expedited, consolidated, and intensified commercial activities have begun. Thus, the corporations formed between the nations have necessitated that the language experts dominate the market. Yet, it ought not to come as a surprise that the more intensified tasks and document circulations have triggered translators to be obliged to assume more responsibilities, leading them to bear much more burden. Thus, MT and CAT tools have come to ease the burden on these translators, equipped with numerous traits the professionals utilize.

Notwithstanding, the popularity of MT and CAT tools has naturally added one more facet to an already multifaceted nature of the field of translation. Translators, who have found themselves left in limbo regarding the ethical questions arising by the nature of their professions, have now encountered a new set of ethical questions caused by this newly-appeared concept. Creativity,

which marks the very core of the translation field, appears to be derailed by the automated translation skills of the MT, which direct translators to be focused on the raw translation and harm the potential creative options. The lack of agency, which stands for the absence of a real person conducting the conversation, appears to be just another problem caused by the artificially created language style of MT. Moreover, the fact that MT relies on shared and collected data has also caused confidentiality questions. Since it should be trained to produce translations as expected from the users, not surprisingly MT is required to obtain and process the users' own entered data. Considering this, any personal or private input is highly likely to be manifested to the broad public and to be reused as if it were created by the MT database. Therefore, in an age, in which the use of MT and CAT tools dominantly shapes the field of translation, it is highly preferable to consider these listed ethical problems so that the ethical codes of the profession and the use of highly-chosen tools can be melted in the same pot. Having regard to this ethical issue, the users and translators should be aware of the jeopardy stemming from the shared data policy and take precautions against unexpected results.

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