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Paradigm Shifts in Arabic Translation and the Role of Artificial Intelligence in Translation

Abstract

The role of translation in human and intercultural interaction is an undeniable fact. Translation, which has had an important place in intercultural interaction since the beginning of human history, has developed according to the characteristics of the era it is in. Artificial intelligence, which has been widely used by both translators and people from different professions in recent times, not only reduces workload, but is also among the choices people use to conduct research. Translators need to embrace technology and see it as a part of their professional development. Machine translation offers increasingly accurate and faster translation thanks to large data stores and deep learning algorithms. However, in texts that contain human elements such as language complexity, cultural structures and original expressions, translators' experience and insights are needed.

Keywords: *communication, translation, artificial intelligence, machine translation, translator*

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Ərəb dilinə tərcümədə paradigma dəyişmələri və tərcümədə suni zəkanın rolu

Xülasə

İnsanlar və mədəniyyətlərarası ünsiyyətdə tərcümənin rolu danılmaz bir həqiqətdir. İnsanlıq tarixinin başlanğıcından etibarən mədəniyyətlərarası qarşılıqlı təsirdə mühüm yerə sahib olan tərcümə, yerləşdiyi dövrün xüsusiyyətlərinə uyğun olaraq inkişaf etmişdir. Həm tərcüməçilərin, həm də müxtəlif peşə sahiblərinin son zamanlarda geniş şəkildə istifadə etdiyi süni intellekt, yalnız iş yükünü azaltmaqla qalmır, həm də insanların araşdırma aparmaq üçün müraciət etdiyi vasitələrdən birinə çevrilmişdir. Tərcüməçilərin texnologiyanı mənimsəməsi və bunu peşəkar inkişaflarının bir hissəsi kimi görməsi vacibdir. Maşın tərcüməsi böyük verilənlər bazası və dərin öyrənmə alqoritmləri sayəsində getdikcə daha dəqiq və sürətli tərcümə təqdim edir. Lakin dilin mürəkkəbliyi, mədəni strukturlar və orijinal ifadələr kimi insan amili olan mətnlərdə tərcüməçilərin təcrübə və intuisiya bacarıqlarına ehtiyac duyulur.

Açar sözlər: *əlaqə, tərcümə, süni intellekt, maşın tərcüməsi, tərcüməçi*

Introduction

Translation, known as the transfer of written or spoken information from one language to another, is a multifaceted process due to the numerous meanings it encompasses and the various functions it fulfills. In its most general definition, translation is the textual and linguistic transfer process carried out from the source language to the target language (Yıldız, 2018, s. 1). Translation has held a significant place throughout the centuries in the exchange of knowledge between people and cultures.

The changes that have taken place in the world of translation from past to present, along with the latest technology in artificial intelligence translation, arouse curiosity and lead us to conduct research in this field. According to written sources, translation activities are among the oldest practices in the world and were an indispensable part of daily life as early as 2000 BCE in Mesopotamia, where multiple languages were spoken. However, it is believed that the earliest translation activities date back to even earlier times (Yılmaz, 2021, s. 18-19). Moreover, focusing on written texts in translation brings forward the characteristic of a source text being translatable into multiple versions in the same or different languages. This, in turn, enables comparison in translation and the development of evaluation methods based on certain criteria over time. The desire of critics/translators who aim to highlight the value of translation to base their assessments on concrete standards has also brought about the notion that translations may vary depending on the criteria applied. It is noteworthy that in pre-Antique times, translations in Mesopotamia and Egypt often reflected such an approach. When examining these translations, it becomes apparent that translators, instead of adopting a “word-for-word” approach in written texts, attempted to translate by breaking down the words of the source text into their smallest morphological units. Preserving the smallest units of the source language was considered a sign of fidelity and accuracy. However, this understanding began to change during the period of Ancient Rome. From that time onward, traditional ideas and discourses about translation began to emerge. The increase in literary translations also played a role in this development. While translations previously served a purely communicative function, it is no coincidence that in Ancient Rome they became a part of cultural policy. This development can be regarded as the result of a conscious decision rooted in Ancient Rome's desire to transmit knowledge into its own culture by drawing inspiration from and utilizing Greek culture and its works. To understand why this period, during which the first discourse on translation emerged, differs from the preceding translation practices, it is necessary to take a closer look at the Ancient Roman era (Yücel, 2007, s. 22-24). In general, the development process of translation can be divided into two distinct time periods. The first period begins in Antiquity and continues until the mid-20th century; during this time, non-scientific subjects are generally at the forefront. The second period, on the other hand, covers the time from the end of the first period to the present day, in which scientific subjects are more prominent. Since both periods are interconnected, understanding the first period is necessary in order to comment on the second (Yücel, 2016, s. 7). The earliest known translation activities in Antiquity began with Cicero and Horace. In the same period, the first known translator in history, a freed Greek slave named Livius Andronicus, translated the *Odyssey* into Latin. In the Middle Ages, religious texts came to the forefront of translation efforts both in Europe and the Islamic World (Yılmaz, 2021, s. 20-22). The emphasis on “meaning” rather than “word” in the translation approach of the Ancient Roman period is a product of a particular understanding. The function of conveying meaning in translation must be sought within the target-reader-oriented approach adopted during that time. This is because, in a translation approach based on preserving the individual words, it becomes difficult to convey meaning in a comprehensible way in the target language. Considering that languages had not yet fully developed in that era, it is only natural that translators, who realized the difficulty of conveying the expressive and literary values of the source language into another, chose to adapt and interpret what they understood from the source text according to their own culture (Yücel, 2007, s. 27).

Research

In translation, which is examined under two main categories as written and oral, different types and methods have been applied throughout history. The translator must use a translation method that is appropriate to the content of the text and/or dialogue to be translated.

According to the mode of expression, the main types of translation are as follows: Written translation: This is the transfer of written texts from the source language to the target language. While conveying information, the translator should remain faithful to the source text and must not add or omit words that could change the meaning. Cultural expressions such as idioms and proverbs should be rendered with their equivalents in the target language. Grammar rules must be followed during translation, and the text should definitely be reviewed after the translation is completed.

Oral translation: Since oral communication among people existed long before written communication, it is the oldest known type of translation. Oral translation itself includes different types such as simultaneous interpretation, consecutive interpretation, liaison interpretation, and whispered interpretation (Durmush, 2018, s. 10-12). Historically, various translation strategies have emerged in relation to these types of translations. According to Vermeer, Cicero developed three different translation strategies based on the text type. Cicero advocated a word-for-word translation approach for philosophical texts where the accurate and faithful transmission of concepts and ideas was essential. In contrast, for literary texts, he promoted a free translation approach that reflects the content rather than the form. In such translations, since the translator does not feel obliged to adhere to the unique style and form of the source text, it is expected that the translator remains sensitive to the expectations of the target audience. In a sense, the translator focuses not on the way the original author expresses the content but on the subject matter itself. Therefore, the topic conveyed by the source text author is interpreted by the translator and rendered into their own language. The writings and views of Cicero have generally been identified with free translation throughout the history of translation theory. However, Cicero laid the foundation for theories that propose an approach based on the function of the text by classifying texts according to their functions. When evaluating Cicero's approaches to translation, it becomes evident that he advocated for a target language/culture-oriented translation. This situation was partly due to the fact that there were few text types at that time that required word-for-word translation. After Ancient Rome, the perception of translation underwent changes through certain historical developments. The foremost among these developments was the influence of religion. With the spread of Christianity and its adoption as the official religion by the government, the function of translation shifted to a different domain. The reason why translation activities continued under institutional structures rather than as individual acts was because translation issues were addressed by clergy during the Middle Ages. Thus, while texts translated in the ancient period to develop one's own language, oratory, and literature mainly dealt with everyday life topics, in the Middle Ages, translations were predominantly of sacred texts in monasteries. The change in subject matter not only affected the content but also brought about certain constraints for translators regarding how these subjects should be conveyed (Yucel, 2007, s. 30-33). Primitive translation methods, while serving as a starting point on the path to the art of translation, continued to be practiced during the late 17th century and the 18th century, a period when the independence of translation was most intensely debated, and alongside these debates, the importance given to translation also increased (Kızıltan, 2000, s. 77). It is possible to say that the rise of translation in the eighteenth century is closely related to the Romantic worldview of the period and the advanced perspectives of writers towards art and literature. The negative effects caused by rationalism—which began during the Enlightenment era—and its reflections in social life such as utilitarianism, practicality, verifiability/provability, and reductionism provoked reactions from Romantic thinkers and writers. Since translation best reflects the characteristics of the Romantic period and its outlook on the world and art, it is impossible to consider the Romantic era separately from translation. It can even be argued that translation overlaps with this period to some extent and is identified with it as the most appropriate means of expressing the artistic understandings of the era. Although many writers in this period were not directly involved with translation, they nevertheless put forward ideas about it. The fact that translation began to have value independently from the source text for the first time during the Romantic period means that it is not merely an imitation of a source text. Here, a parallel can be drawn with the Romantics' understanding of nature (Yucel, 2007, s. 51-63).

Machine Translation

It is an undeniable fact that both written and oral translation serve not only as means of interpersonal or intercultural communication but also as a market. Translation is a service provided to clients across various markets, ranging from consumers to institutions, and from global to public spheres (Eser, 2015, p. 1). As the volume of translation increases, translators are increasingly benefiting from technology and machine translation to assist them in their work. To maximize the usefulness of technology, it has become necessary to change the perspective on the translation process. While translation used to be a laborious task in the past, nowadays the use of technology by

translators has transformed this process into a more efficient and less strenuous one (Bowker, 2002, p. 129). The term "Machine Translation" is basically used in two senses:

- 1) It is a part of computational linguistics that studies the use of software tools to translate text or speech from one language (source language) to another (target language).

- 2) Machine translation refers to the process of translating any text in the source language into the target language through software/application without human intervention (human intervention occurs only within the software, not in the source or target text) (Sadıkov & Sarıgül, 2021, p. 193).

Research within the history of translation has conceptualized the phenomenon of translation in various ways, influenced both by the understanding of the respective era and by the evolving demands of translation in a globalizing world, which in turn affect the competencies required of translators (Eser, 2015, p. 18). This change requires translators to develop their technological skills in addition to their linguistic knowledge and abilities based on the cultural structure of the language. Translators need to embrace technology and see it as a part of their professional development. In this way, translators can make the most of the advantages offered by technology and provide more practical and effective translations. However, excessive reliance on technology requires translators to be cautious about preserving their professional identity and values.

Although some researchers had considered the problem of automation in translation until the 1940s, the studies were not pursued because it was not possible to develop and test them in practice. From the 1940s to the mid-1960s, with the emergence of the first computers, several teams developed machine translation systems, raising expectations for the development of the field. The ALPAC report, commissioned by American funding organizations in 1965-1966, had a striking impact on the field. The report was extremely negative, describing the research conducted up to that point as flawed and useless. The already limited financial support came to an end with this report. The 1990s witnessed the emergence of a new approach based on statistics and very large bilingual corpora. This trend was derived from a series of groundbreaking articles written by a research group working at IBM, one of the world's largest information technology companies, in the late 1980s and early 1990s. These articles had a significant impact with the development of statistical and experimental approaches in natural language processing. Today's most popular translation systems (Google and Bing) are based on a variant of this approach (Poibeau, 2017, pp. 35-36). Machine translation, empowered by large data repositories and deep learning algorithms, is increasingly providing more accurate and faster translations. However, in texts that involve human elements such as linguistic complexity, cultural structures, and unique expressions, the experience and insights of human translators remain necessary.

The history of translation also sheds light on current translation paradigms. For example, shifts from commanding, static, subjective, and source-oriented approaches to descriptive, functional, objective, and target-oriented approaches indicate certain paradigm changes within the phenomenon of translation. Thus, new perspectives on translation paradigms as well as the concepts of translation and translators have emerged (Eser, 2015, p. 20). Since the mid-20th century, perspectives in the field of translation have begun to diversify. Especially some translators who are also authors have developed approaches that add depth to the phenomenon of translation based on their personal experiences. These approaches have increasingly emphasized how complex and culturally intertwined the process of transferring a source text into the target language truly is (Gürçağlar, 2016, p. 44). Nowadays, although efforts are made to utilize machine translation in managing such a complex process, meaning errors and translation mistakes can still occur in machine translation. The syntactic differences between languages pose challenging problems for machine translation. Different syntactic structures require the rearrangement, addition, and omission of words during translation (Koehn, 2010, p. 51).

Machine translation consists of systems, each having its own dynamics. Some of these systems are as follows:

1. A direct translation system is a system that tries to produce a direct translation from the source language to the target language. This system is based on a dictionary: a pre-loaded dictionary provides word-for-word translations, and then the system arranges these words in a way appropriate for the

target language according to certain rules. In this type of system, there is no syntactic analysis, and the rearrangement rules are applied directly to the surface forms.

2. Transfer systems are more complex than direct translation systems because they integrate syntactic analysis. These systems perform translation not by giving the literal meaning of the words in the source text but by considering their meaning within the sentence and the appropriate equivalents in the target language. Therefore, as long as the syntactic component provides accurate information about the source and target languages, the result is assumed to be more experiential than direct translation (Poibeau, 2017, p. 27).

Along with these systems, methods such as Rule-Based Machine Translation, Statistical Machine Translation, and Neural Machine Translation are currently the most commonly preferred approaches. The Rule-Based Translation method is known as the first method used for automatic translation. Machine translation using this method is based on converting source language data into a pre-programmed computer language via translation engines and then transferring it to the target language codes introduced to the computer. Translations performed with rule-based machine translation yield better results in direct proportion to the amount of common ground between the source and target languages in terms of word structures, grammar rules, and word order principles.

Statistical Machine Translation, on the other hand, is the process of determining the most appropriate equivalent of a given sentence in the source language in the target language. In the Statistical Machine Translation method, human-made translations are analyzed to learn rules (machine learning), the most appropriate equivalent in the target language is identified statistically, and then the translation is carried out.

Neural Machine Translation, which is one of the newest and most important machine translation methods today, is an end-to-end learning approach for automatic translation. In this method, sentences are not translated piece by piece but all parts of the sentence are translated simultaneously. Since sentences are considered as a whole in this method, translations are evaluated in a broad context, and common usages are taken into account to be rearranged with appropriate grammar, making the output closer to natural spoken language (Sadıkov & Sarıgül, 2021, s. 193-196).

With the increasing use of machine translation and neural machine translation methods, information about how these systems work, and especially the algorithms of these methods, are being published as open source. One of them, OpenNMT, is an open-source library developed for training and deploying neural machine translation models (Sadıkov & Sarıgül, 2021, s. 200).

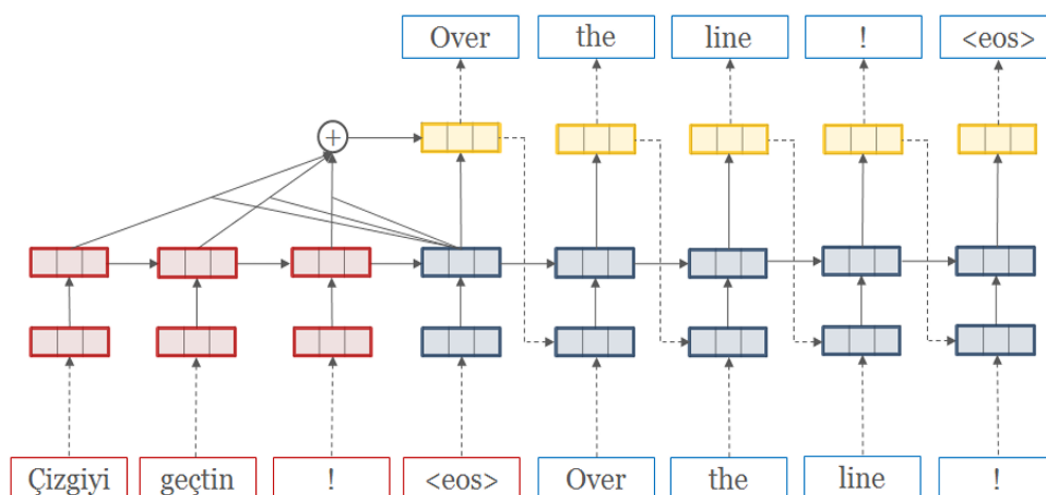


Figure1: Schematic view of neural machine translation. The red source words are first mapped to word vectors and then fed into the current neural network (RNN). Upon seeing the <eos> symbol, the final time step initializes a target blue RNN. At each target time step, attention is applied over the source RNN and combined with the current hidden state to produce a prediction of the next word. This prediction is then fed back into the target RNN (Klein, Kim, Deng, Senellart, Rush, 2017, s. 67).

Artificial Intelligence and Its Working Principles

There is no consensus on the definition of artificial intelligence. However, artificial intelligence can be defined as technological processes developed to meet people's daily needs and to enable them to perform their tasks more practically (Yılmaz, 2023, s. 342). Artificial intelligence, which has recently been widely used by both translators and professionals from various fields, not only reduces workload but also has become a preferred tool for conducting research.

The emergence of artificial intelligence as a new research field began with a meeting held at Dartmouth College in the United States in 1956 during the Summer Research Project. In this meeting, the knowledge developed up to that point was systematized, and the American scientist John McCarthy proposed the term "artificial intelligence" for this work. At that time, AI systems were insufficient for solving large-scale global problems. However, the success of specialized programs attracted attention and led to the emergence of numerous AI systems. The philosophy of artificial intelligence was first introduced by the famous British mathematician Alan Turing. Six years before the Dartmouth conference (in 1950), Turing published an article titled *Computing Machinery and Intelligence* in the philosophy journal *Mind*. In this article, Turing raised the question "Can machines think?" and dismissed objections against the claim that machines could think.

Recently, both technological and theoretical advancements have shed light for some researchers. These researchers have initiated efforts to redevelop general-purpose intelligent systems. With these efforts, the aim is to create more general-purpose intelligent systems by utilizing advances in computer technology and artificial intelligence techniques (Doğan, 2002, s. 44-46).

Conclusion

Translation, throughout history, has evolved beyond being merely a tool for transferring between languages; it has become a fundamental driver of cultural, political, and scientific interactions. Translation activities, which began in ancient times, played a decisive role in human history, particularly in the transmission of religious texts to different cultures, the sharing of scientific knowledge, and the preservation of cultural heritage.

In the modern era, translation has become increasingly complex and multidimensional due to growing globalization, technological advancements, and the diversification of communication tools. The specialization of written and oral translation types has made it necessary for translators to possess not only linguistic skills but also domain knowledge and cultural awareness.

Especially from the late 20th century onward, developments in machine translation alongside digitalization have led to profound changes in translation practices. Artificial intelligence-based systems have facilitated the automation of the translation process while simultaneously transforming the role of translators. This shift has brought new regulations in translator training and professional practice.

All these developments have caused paradigm shifts in the field of translation; a new era has emerged moving from traditional, source-oriented approaches to target-oriented, functional, and cultural approaches. These paradigm shifts have directly influenced not only translation theories but also translation education programs, professional standards, and technological infrastructure.

In this context, translation should no longer be regarded as merely a linguistic activity; it must be understood as an interdisciplinary field encompassing multiple factors, including cultural, cognitive, and technological dimensions. Understanding this transformation is of great importance both for updating translation theories and for developing education programs that meet the needs of the contemporary era.

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