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ABSTRACT: The rapid development of artificial intelligence and language technologies has significantly transformed the field of translation. Machine translation has evolved from rule-based systems to sophisticated neural machine translation models capable of processing large amounts of multilingual data and generating increasingly fluent translations. At the same time, human translation continues to play a crucial role in professional, literary, academic, legal, diplomatic, and culturally sensitive communication. This article presents a comparative analysis of machine translation and human translation, focusing on their strengths, limitations, functional differences, and potential for cooperation. The study examines major aspects of translation quality, including accuracy, fluency, contextual interpretation, cultural adaptation, pragmatic meaning, terminology, creativity, consistency, speed, and ethical responsibility. A qualitative comparative methodology is employed to analyze the capabilities of machine and human translators in different communicative contexts. The findings indicate that machine translation provides significant advantages in terms of speed, accessibility, consistency, and the ability to process large volumes of text. However, human translators demonstrate greater flexibility in interpreting ambiguous meanings, understanding cultural references, preserving stylistic nuances, and reproducing pragmatic and emotional effects. The study also emphasizes the growing importance of human post-editing and human-machine collaboration. Rather than replacing human translators entirely, modern translation technologies are increasingly becoming supportive tools that can improve productivity and efficiency. The article concludes that the future of translation is likely to involve a collaborative model in which artificial intelligence and human expertise complement one another. Such a model can combine the computational efficiency of machine translation with the cultural, pragmatic, creative, and ethical competence of human translators.

KEYWORDS: machine translation, human translation, artificial intelligence, neural machine translation, translation quality, post-editing, translation technology, cultural adaptation, pragmatics, artificial intelligence, human-machine collaboration.

Translation has historically served as one of the most important means of communication between different linguistic and cultural communities. It has contributed significantly to the exchange of knowledge, literature, science, education, technology, and cultural values. In the contemporary world, the demand for translation has increased dramatically as a result of globalization, international trade, academic cooperation, digital communication, migration, tourism, and the rapid expansion of online content.

At the same time, technological developments have fundamentally changed the way translation is performed. The emergence of machine translation has introduced new possibilities for processing multilingual information quickly and efficiently. Modern translation systems can translate large amounts of text within seconds, making multilingual communication more accessible to individuals and organizations around the world.

Machine translation refers to the use of computer systems and computational methods to translate texts from one natural language into another without the direct involvement of a human translator during the initial generation of the translation. The development of machine translation has passed through several major stages, including rule-based machine translation, statistical machine translation, and neural machine translation. The emergence of neural machine translation has significantly improved the fluency and naturalness of automated translations. Neural systems use artificial neural networks to identify patterns in large collections of multilingual data. Unlike traditional rule-based systems, neural models are capable of processing broader contextual relationships and generating translations that often appear more natural.

Despite these developments, human translation remains essential. Human translators possess cognitive, cultural, pragmatic, and creative abilities that are difficult to reproduce through automated systems. They can interpret ambiguous expressions, recognize irony and humor, understand cultural references, evaluate the communicative intentions of authors, and adapt texts to specific audiences. The comparison between machine and human translation is therefore not simply a question of determining which one is "better." Instead, it is necessary to examine the particular contexts in which each approach is most effective.

For example, machine translation may be highly useful for translating large amounts of technical documentation, preliminary information, online communication, and repetitive texts. Human translators, in contrast, may be more appropriate for literary works, legal documents, diplomatic communication, advertising, academic publications, and texts that require cultural adaptation. The central question of the present study is how machine translation and human translation differ in terms of

quality, efficiency, cultural competence, contextual interpretation, and communicative effectiveness.

The objectives of the research are:

1. to examine the development and characteristics of machine translation;
2. to analyze the main characteristics of human translation;
3. to compare machine and human translation in terms of accuracy and fluency;
4. to investigate the role of context and cultural knowledge;
5. to examine the treatment of pragmatic meaning and ambiguity;
6. to analyze the advantages and limitations of artificial intelligence in translation;
7. to explore the role of human post-editing;
8. to examine the future relationship between human translators and translation technologies.

The significance of the research lies in the increasing role of artificial intelligence in professional and educational translation. Understanding the strengths and limitations of both machine and human translation is essential for developing effective translation practices in the digital era.

CONSISTENCY AND TERMINOLOGY

Machine translation offers significant advantages in terminology management. Large-scale translation projects often require consistent use of technical terms. A machine translation system can apply terminology databases and translation memories to maintain consistency across thousands of pages. Human translators may unintentionally use different terms for the same concept. However, human translators are better able to determine whether a term should be translated consistently or adapted according to context. Therefore, the strongest approach may involve combining automated terminology management with human review.

HUMAN CREATIVITY AND MACHINE TRANSLATION

Creativity is particularly important in literary translation, advertising, poetry, slogans, and creative writing.

Human translators can recreate:

- humor;
- wordplay;
- rhythm;
- emotional tone;
- literary style;
- cultural associations.

For example, a slogan may depend on a pun that cannot be translated literally. A human translator may create a new expression that differs from the original wording but

produces a similar communicative effect. Machine translation systems are increasingly capable of generating creative language, but their ability to understand the deeper cultural and rhetorical purpose of creative texts remains limited. Therefore, human creativity continues to be highly valuable.

HUMAN POST-EDITING

Human post-editing has become an important part of modern translation workflows. Post-editing refers to the process of reviewing and correcting machine-generated translations. The post-editor may need to correct:

- grammatical errors;
- mistranslations;
- terminology;
- word order;
- cultural references;
- stylistic problems;
- pragmatic errors;
- inconsistencies.

There are generally two broad approaches to post-editing. Light post-editing focuses on correcting major errors and making the text understandable. Full post-editing aims to produce a polished translation suitable for professional publication. The increasing use of post-editing demonstrates that human and machine translation are not necessarily competing processes. They can operate together in an integrated workflow.

DISCUSSION

The comparative analysis demonstrates that machine translation and human translation possess distinct advantages and limitations. Machine translation has transformed the accessibility and speed of multilingual communication. It allows individuals and organizations to process enormous quantities of text rapidly and at relatively low cost. The development of neural machine translation has significantly improved the fluency of automated output. In many routine translation tasks, machine-generated texts may be sufficiently accurate for general communication. However, high fluency can sometimes conceal errors. A machine-generated sentence may appear natural while containing an incorrect interpretation of the original meaning.

Human translation remains essential when texts require complex interpretation, cultural adaptation, creativity, or high levels of responsibility. The analysis also suggests that the distinction between machine and human translation is becoming less rigid. Modern translation practice increasingly involves cooperation between human translators and technological systems. The translator of the future may not simply translate texts manually. Instead, the translator may manage technological tools,

evaluate machine output, correct errors, and ensure cultural and pragmatic appropriateness.

CONCLUSION

Machine translation and human translation represent two complementary approaches to the complex task of multilingual communication. Machine translation has developed rapidly and now provides impressive levels of speed, accessibility, consistency, and fluency. It has become an essential tool for organizations and individuals who need to process large quantities of multilingual information. However, human translation continues to demonstrate significant advantages in areas that require contextual interpretation, cultural competence, pragmatic awareness, creativity, emotional sensitivity, and ethical responsibility.

The comparison presented in this study demonstrates that machine translation should not be viewed simply as a replacement for human translators. Instead, it should be understood as a powerful technological tool that can support and enhance human translation. Human translators remain essential for interpreting ambiguous expressions, understanding cultural references, preserving stylistic nuances, reproducing pragmatic meanings, and adapting texts to specific audiences. The most promising model for the future is therefore a collaborative approach in which artificial intelligence and human expertise complement each other. In such a model, machines can perform repetitive, large-scale, and time-consuming tasks, while human translators focus on complex interpretation, cultural adaptation, quality control, and creative decision-making.

The growing importance of artificial intelligence also requires a transformation in translator education. Future professionals must combine advanced linguistic competence with technological literacy, intercultural awareness, pragmatic competence, and critical thinking. Ultimately, the goal of translation is not merely to produce grammatically correct sentences in another language. The fundamental purpose is to communicate meaning effectively across linguistic and cultural boundaries. Machine translation can accelerate this process, but human intelligence, cultural understanding, and professional judgment remain essential for ensuring that communication is accurate, meaningful, natural, and appropriate.

The future of translation is therefore unlikely to be defined by a simple competition between humans and machines. Instead, it will increasingly be shaped by collaboration between human expertise and artificial intelligence. Such collaboration has the potential to make translation faster, more accessible, and more efficient while preserving the human qualities that are essential to meaningful intercultural communication.

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