

The Real Question in Translation — How to Balance the Accuracy of Machine Translation with the Creativity of Human Translation?

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Abstract— *With the rapid development of artificial intelligence and machine learning, machine translation has made remarkable progress in accuracy and speed, and has become a powerful tool for learning languages in the context of globalization. At the same time, however, machine translation still has certain limitations in handling complex language structures, cultural differences, and contextual understanding, so the intervention of human translation is necessary. This study aims to explore how to give full play to the creativity of human translation while ensuring translation accuracy and speed, so as to achieve a balance between machine translation and human translation. It first reviews the historical development of machine translation and human translation, their advantages and disadvantages, and their application in different fields, and discusses the advantages and limitations of machine translation in terms of accuracy and speed, as well as the unique creativity of human translation. The study finds that machine translation is relatively standardized when processing large amounts of textual content, but human translation has a more prominent advantage when it comes to literary or other highly specialized texts. To address this issue, this study proceeds from four strategies: 1. hybrid translation mode; 2. post-editing; 3. customized machine translation; 4. creative intervention of human translation, so as to achieve an effective balance between machine translation and human translation.*



Keywords— *machine translation, human translation, accuracy, creativity, balance strategy*

I. THE HISTORY AND PROS AND CONS OF MACHINE TRANSLATION

1.1 The History of Machine Translation

The birth of machine translation can be described as a leap from dream to reality. In the 1940s, computers were still a novelty. In 1947, the American mathematician Warren Weaver put forward a bold idea: to use computers for language translation^[1]. At the time, the idea sounded like science fiction, but Weaver and his colleagues did not give up. They began to try to use computers to analyze and translate language, which can be regarded as the prototype of machine translation.

By the 1950s, both the United States and the Soviet Union had begun formal research on machine translation. In the Soviet Union, because officials believed that human

translation was sufficient to handle foreign scientific and technological information, they showed little interest in the actual results and implementation of machine translation (MT), which led to a rapid decline in research enthusiasm. Nevertheless, machine translation continued to develop in the United States, Japan, the former Soviet Union, and some other countries during the 1960s and 1970s. American research focused mainly on Russian-to-English translation, while Soviet research concentrated on English-to-Russian systems^[2]. For example, at the University of Washington (Seattle), Erwin Reifler's research represented the lexicon-based "direct" approach^[3], which involved building large bilingual dictionaries in which lexical information was used not only to select lexical equivalents but also to resolve grammatical issues without using

syntactic analysis. The system was installed for the U.S. Air Force and ran for many years until it was replaced by Systran in 1970. In addition, researchers at the RAND Corporation conducted statistical analyses on a large number of Russian physics texts to extract bilingual word lists and grammatical information, and on this basis wrote a computer program for rough translation. Soviet research was equally vigorous, employing a mixture of empirical and fundamental theoretical methods. At the Institute of Precision Mechanics, the — English-to-Russian translation research led by D. Y. Panov was similar to Georgetown University's research but yielded fewer practical results. Over time, machine translation research gradually formed two major schools: the rule-based approach and the statistical approach. The rule-based approach is like writing a thick grammar book for a computer, telling it the rules of each language. The statistical approach, by contrast, lets the computer learn from a large amount of translated text on its own and identify the patterns.

In the 21st century, with the rapid development of artificial intelligence technology, especially the emergence of neural network technology, machine translation has ushered in a new spring. Neural networks are able to simulate the way the human brain works, which greatly improves the accuracy of machine translation. In 2016, Google launched its neural-network-based translation system, Google Neural Machine Translation (GNMT), marking a major breakthrough in machine translation technology^[4]. Today, machine translation has become increasingly intelligent and increasingly accurate. Whether for travel, business, or study, machine translation provides us with great convenience.

1.2 The Pros and Cons of Machine Translation

1.2.1 The Advantages of Machine Translation

Machine translation (MT) technology has continued to advance with the development of artificial intelligence and natural language processing, and it demonstrates obvious advantages in many aspects. Machine translation can process large amounts of text quickly, which is very useful in scenarios requiring instant translation (such as news reports, social media, and customer service). The Canadian Press used the "Ultrad" application to translate English updates from the Canadian Press or the Associated Press into other languages. Since its development in 2018, the application has evolved from basic machine translation to intelligent translation, using machine learning technology to improve accuracy and reduce errors.

Machine translation can process large volumes of standardized documents and product descriptions in a short time, at a relatively low cost. A company may need to translate product manuals from one language into multiple

languages for users in different regions. Machine translation can quickly generate an initial translation, which is then subjected to necessary proofreading and adjustment by human translators, thereby greatly reducing translation costs. Advanced machine translation systems such as Google Translate and DeepL can process hundreds or even thousands of characters of text within seconds, greatly improving work efficiency. Related research shows that machine translation combined with post-editing (PE) can significantly save time and cost^[5]. Previously, a human-translated project of 180,000 characters took 37 days to complete, whereas machine translation plus post-editing took only 24 days to complete a project of 189,000 characters, saving 13 days and up to 50% of the cost. Machine translation also enables non-specialists to access and understand content in different languages, thereby improving the accessibility of information. At the same time, machine translation can translate the languages of different countries, providing useful information and skills. The vivid conversion between different languages reflects the diversity of machine translation:

1. English to Chinese

Source (English):

"The weather is getting warmer, and the days are getting longer."

Machine translation (Chinese):

"天气变得越来越暖和，白天变得越来越长。"

Machine translation can handle simple everyday expressions. Sometimes the translation result may not be the most natural expression in Chinese, but the meaning is basically accurate.

2. Chinese to English

Source (Chinese):

"春天来了，万物复苏。"

Machine translation (English):

"Spring is coming, and all things are reviving."

In this example, machine translation captures the mood of the original. Although "reviving" is not the most common expression, on the whole it can still convey the vibrant, vital feeling of spring.

3. Spanish to French

Source (Spanish):

"El clima está cambiando rápidamente."

Machine translation (French):

"Le climat change rapidement."

4. German to Japanese

Source (German):

"Die Technologie entwickelt sich ständig."

Machine translation (Japanese):

“技術は絶えず発展しています。”

5. Arabic to Russian

Source (Arabic):

"التكنولوجيا تتطور بسرعة"

Machine translation (Russian):

"Технология быстро развивается."

1.2.2 The Disadvantages of Machine Translation

Although machine translation (MT) has made remarkable progress in many respects, it still has some shortcomings. Sometimes machine translation suffers from insufficient contextual understanding and may find it difficult to accurately grasp the context of a text, including cultural background, humor, irony, and idioms. For example, the English expression "It's raining cats and dogs" (下着倾盆大雨), if translated literally, might be rendered by machine translation as “正在下猫和狗”. Sometimes machine translation may make errors in handling complex grammatical structures and sentence patterns, especially in languages whose grammatical structures differ from those commonly seen in the training data. In the case of polysemy, machine translation may find it difficult to choose the correct meaning of a word, resulting in inaccurate translation. The English word "bank" can mean “银行” (bank) or “河岸” (riverbank); if the machine translation system cannot choose the correct meaning based on the context, it may cause confusion. Machine translation usually lacks the creativity and style of human translation and may fail to capture the literary value of the original text or the personal style of the author. When translating poetry or literary works, machine translation may fail to convey the emotional depth and artistic beauty of the original; for example, when Hemingway's concise style is translated into another language, its unique charm may be lost.

Machine translation results may require human review and editing to ensure accuracy, which adds extra workload^[5]. When translating legal documents or medical reports, even if machine translation is used, professional human translators are still needed to carry out careful proofreading and editing to ensure the accuracy and professionalism of the information. In professional fields such as law and medicine, machine translation may not achieve the required accuracy and professionalism, and human translation is still needed. When translating medical research papers, machine translation may fail to

accurately translate professional terms, such as “幽门螺杆菌” (*Helicobacter pylori*), which may cause difficulties for medical professionals in understanding and application. Although machine translation has obvious advantages in processing large amounts of non-specialist texts, human translation remains indispensable in cases requiring high precision, deep contextual understanding, and creative expression. As technology advances, these shortcomings of machine translation may gradually diminish, but its complementary relationship with human translation may persist in the long term.

1.3 Practical Applications of Machine Translation

Machine translation is already widely used in daily life, helping people overcome language barriers and communicate effectively. Machine translation plays an important role in education and learning: students can use it to assist in learning foreign languages and understanding foreign-language textbooks and materials. When traveling abroad, tourists can use machine translation applications such as Google Translate and Youdao Translate to communicate with local people and solve the problem of language barriers, such as asking for directions or ordering food. When researchers consult foreign literature, machine translation can help them quickly understand the general content of the literature and improve reading efficiency. In addition, at international academic conferences, machine translation technology can provide real-time speech translation, facilitating communication among scholars from different language backgrounds. In international trade, when enterprises communicate with overseas customers, machine translation tools can help both parties quickly understand each other's intentions. For example, merchants and overseas buyers on Alibaba International Station can use machine translation functions to communicate and facilitate the conclusion of transactions. The machine translation approach has many advantages, such as fast development, short cycles, and no need for human intervention; moreover, when training data in a specific field are sufficient, the translation, though not perfect, can still reach a comprehensible level.

In the national machine translation and post-editing competition previously organized by Tencent's TranSmart, an interactive translation mode was introduced: machine translation could update the translation in real time according to the translation fragments entered by the contestants, so that translators could compare and evaluate the results; after the competition, translators could view the experts' feedback. In addition, in the Eighth Machine Translation and Post-Editing Competition, contestants were required to edit on the basis of a given machine-translated draft; the system automatically recorded the

contestants' revision traces, and an AI assistant chat window was provided, in which contestants could enter dialogue commands or use preset commands to polish the translation or look up synonyms.

II. THE HISTORY AND PROS AND CONS OF HUMAN TRANSLATION

2.1 The History of Human Translation

The historical development of human translation is a continuous process spanning thousands of years, closely connected with the development of human civilization. In the Earliest human societies, as different tribes and peoples came into contact, simple language exchange and gesture communication gradually evolved into the earliest translation activities. These activities were initially informal and were carried out by merchants, travelers, or diplomats as needed.

With the progress of civilization, especially the invention of writing, translation began to assume a more important role. In ancient civilizations such as Egypt, Mesopotamia, China, and India, translation work was usually undertaken by priests, scholars, or court officials, who converted religious texts, legal provisions, or diplomatic documents from one language into another.

Entering the Middle Ages, translation activities developed further with the needs of religious dissemination and academic research. For example, the translation of the Bible enabled Christianity to spread into different cultural and linguistic environments. At the same time, the Arab world played an important role during this period: Arab scholars translated a large number of Greek, Roman, and Indian scientific, philosophical, and medical works, laying the foundation for the later Renaissance.

During the Renaissance, the rediscovery of and interest in classical culture promoted the translation of a large number of ancient Greek and Roman works. The translators of this period were concerned not only with the conversion of language but also with conveying the style and spirit of the original, marking an important stage in the development of translation practice and theory.

With the colonial expansion of modern Europe and the scientific revolution, the demand for translation increased further. Colonists needed to translate local languages for the purpose of administration, while scientists needed to translate foreign research results to promote the exchange of knowledge. During this period, translation gradually became professionalized, and specialized translators and institutions emerged.

In the modern era, with the development of globalization, the demand for human translation has

reached an unprecedented level. Translation is no longer merely the conversion of language but the exchange of culture, technology, and knowledge. Translators need professional language skills and deep cultural understanding to ensure the accuracy and naturalness of translation. At the same time, the translation industry has begun to show a trend toward professionalization and standardization, and translation education and certification have gradually become part of a translator's career.

In terms of technical assistance, since the mid-20th century, the development of computer-assisted translation (CAT) tools has greatly improved translation efficiency and quality. These tools include electronic dictionaries, translation memory software, and terminology management tools, which help translators complete their work more quickly and consistently^[6]. The historical development of human translation is a process of continuous evolution, from the initial simple communication to today's highly specialized and standardized industry. With the development of society and the advancement of technology, the forms and methods of human translation are constantly changing, but its core goal — to convey information accurately and effectively — has never changed.

2.2 The Advantages of Human Translation

The advantages of human translation include the ability to accurately understand and convey the semantics and context of the original text, especially when handling complex grammatical structures, polysemy, and capturing the literary value of the original or the author's personal style. Human translation can provide customized services to meet the translation needs of different fields, which is difficult for machine translation to achieve. Human translation can deeply understand the context and cultural background of the original text, thereby providing a more natural and appropriate translation. When translating literary works, human translators can capture the author's intention, emotional coloring, and culturally specific ways of expression. For example, when translating the poems in 《红楼梦》(Dream of the Red Chamber) into English, human translators strive to preserve the artistic conception and rhythm of the poems while ensuring that target readers can understand their deeper meaning. Human translators can creatively express the content of the original text according to the habits and style of the target language, making the translation more vivid and appealing.

In advertising translation, human translators creatively adjust the advertising copy according to the culture and consumer preferences of the target market to make it more attractive. For example, when translating "Just Do It" into Chinese, a human translator may choose

the expression “只管去做”, which preserves the motivating meaning of the original while conforming to Chinese expression habits. In professional fields, human translation can accurately understand and use professional terminology, ensuring the professionalism and accuracy of the translation. In medical translation, human translators can accurately translate professional terms in medical reports, such as “幽门螺杆菌” (*Helicobacter pylori*), and ensure that the translation conforms to the norms and requirements of the medical field. During localization, human translators can customize product descriptions, user manuals, and so on according to the cultural characteristics and consumer habits of the target market. Just as when localizing a game into different language versions, human translators adjust the dialogue and plot in the game according to local culture to make it more relevant to local players. In legal document translation, human translators carry out multiple rounds of proofreading and review to ensure the accuracy and consistency of the translation. For example, when translating an important business contract, a human translator will carefully check every clause to ensure that it complies with legal requirements and is free of ambiguity.

Human translation excels at handling complex, unstructured texts such as poetry, drama, and song lyrics. When translating poetry, human translators strive to preserve the rhythm, rhyme, and emotional expression of the original while producing a translation with equal artistic effect. For example, when translating Shakespeare's sonnets into Chinese, human translators attempt to convey their profound emotion and beauty while preserving the structure of the original poems. Human translation has obvious advantages in translation tasks that require deep understanding, creative expression, and high quality.

2.3 The Disadvantages of Human Translation

At present, with the advancement of science and technology, human translation faces certain challenges in many aspects. Human translation usually requires payment of professional fees, and the cost can be very high, especially in fields requiring professional knowledge, such as legal, medical, or technical translation. Compared with machine translation, human translation is usually slower, especially when processing large amounts of text. This may lead to project delays and affect business processes. Translation quality depends to a large extent on the personal ability of the translator, and differences in skill among different translators may lead to inconsistent translation quality. Translators may feel fatigued after working for long periods, which may affect the accuracy and efficiency of translation and lead to errors and

omissions. In the era of big data, human translation finds it difficult to handle massive amounts of textual data, which limits its application in scenarios that require rapid processing of large amounts of information. As business grows, the expansion and management of a human translation team may become complex and expensive, making it difficult to adapt to rapidly changing market demands. The quality of human translation depends to a large extent on the translator's personal experience and knowledge, which may lead to translations in certain fields that are insufficiently professional or accurate. When handling sensitive information, human translation may involve the risk of information leakage, especially when outsourcing translation services. With the development of technology, human translation may find it difficult to keep up with new technological trends, such as the application of artificial intelligence and automation tools. It may also be unable to keep pace with language development, especially emerging Internet slang and industry terminology, which may cause translations to become outdated.

Despite these disadvantages, human translation still has irreplaceable value in translation tasks that require high quality, deep understanding, and creative expression. With the development of technology, the combined use of human translation and machine translation (such as post-editing) may become a trend to overcome these disadvantages and improve the overall efficiency and quality of translation.

III. HOW TO BALANCE MACHINE TRANSLATION AND HUMAN TRANSLATION

3.1 Hybrid Translation Mode

The hybrid translation mode is a translation method that combines the efficiency of machine translation with the accuracy of human translation. By rationally allocating the tasks of machine translation and human translation, it achieves a balance between translation efficiency and quality. Generally, through pre-translation and initial draft generation, machine translation tools (such as DeepL, Kimi, 小牛, Google Translate, etc.) can be used to quickly generate an initial translation draft, which is especially suitable for texts with large volume and relatively standardized content. Human translators then review the initial draft generated by machine translation, focusing on issues such as grammatical errors, misuse of words, and incoherent logic, and make corrections.

Secondly, a certain division of labor is needed: texts with simple structures, high repetition, or clear patterns are assigned to machine translation, such as the standardized

terminology in product manuals. Texts involving cultural background, metaphors, professional terminology, or complex logic are translated by human translators. Grammatical and spelling checks are performed on machine translation results to correct obvious errors, or the machine translation results are comprehensively revised, including adjusting sentence structure, optimizing word choice, and ensuring semantic accuracy. For people engaged in translation-related work, it is very important to build a translation memory database. Professional tools such as Déjà Vu or Trados are used to store translated content in the translation memory database, so that machine translation can refer to the content in the memory database when processing new texts, thereby improving the consistency and accuracy of translation. For example, when related research mentions the translation of the paper 《海上风电支撑我国能源转型发展的思考》^[7-8], the original contains the four-character expression “西富东贫、北多南少”. Machine translation usually renders it literally as "rich in the west and poor in the east, more in the north and less in the south", which, though complete in meaning, is not concise enough. Human translation optimizes it to "rich in the west and north, poor in the east and south", which not only shortens the length but also, by using "but" instead of "and", clearly reproduces the logical meaning of the original. In another factory business translation project involving Thai, Mongolian, and Spanish, the project team adopted a hybrid mode of rapid pre-translation and human proofreading:

1. Machine pre-translation:

The translation project manager configured the target language in the translation platform and enabled the machine translation function to quickly pre-translate the product interface, menus, prompts, and so on.

2. Human proofreading:

Proofreaders proofread the pre-translated content, correct machine translation errors, and optimize the expressions. For example, machine translation may render “谷电供热/冷” literally as "valley electricity for heating/cooling", while human proofreading optimizes it to "valley electricity for heating and cooling", making the expression more natural.

3. Updating and testing:

The proofread translation is updated into the product by implementation staff, and testers verify the page display and functionality. Through this hybrid translation mode, the project greatly shortened the translation cycle and reduced translation costs while ensuring translation quality.

The key to the hybrid translation mode lies in rationally allocating the tasks of machine translation and human translation and giving full play to the advantages of both. Machine translation can quickly generate initial drafts and handle simple and repetitive content, while human translation focuses on correcting errors, optimizing expressions, and handling complex content. Through post-editing and the maintenance of translation memory databases and terminology databases, translation efficiency and quality can be further improved.

3.2 Post-Editing (PE)

Whether it is machine translation or human translation, both need to face the issue of translation correction when dealing with large workloads. It can be said that nothing is perfect, and all kinds of problems always arise in the process of translation. On this basis, post-editing needs to be considered. Post-editing of machine translation (PEMT) is an efficient translation mode that combines machine translation with human translation: an initial draft is generated by machine translation, and then human translators edit and correct it, thereby achieving an effective balance between translation efficiency and quality^[5]. First, it is necessary to choose the most appropriate vocabulary: machine translation may not be able to accurately understand the meaning of words in context, so translators need to select the most appropriate words in combination with the theme and context of the text. Moreover, machine translation may not be accurate enough in translating proper nouns and terminology, so translators need to make adjustments according to the specific field. The word order of sentences generated by machine translation is adjusted according to the expression habits of the target language. Machine translation may generate overly complex sentence patterns, which translators need to simplify and optimize.

At the discourse level, connectives and other elements can be added to make the translation more coherent; machine translation may make errors in pronoun reference, and translators need to trace back to the original text to clarify the referent. This is followed by quality assessment and optimization: selecting high-confidence translations for editing. Through quality assessment methods, translations with high confidence from machine translation are selected for post-editing, while translations with low confidence are translated directly by humans. For example, when translating the book 《Growing Hope》, the translator used DeepL to generate an initial draft and then performed post-editing^[9]. For example:

Source:

I was taken to see one of the survivors.

DeepL translation:

“我被带去看了其中一个幸存者。”

Post-editing:

“有人带我去看了其中一棵幸存之树。”

Analysis:

In this context, “survivor” refers to the camphor tree that survived the atomic bombing, so “幸存者” should be changed to “幸存之树”.

In addition, when translating the article 《加速构建电为核心的现代能源体系》, the translator optimized the machine translation result^[10]:

Source:

“实现……全面替代。”

Machine translation:

achieve a comprehensive replacement

Post-editing:

With the development of energy storage technology, based on the above-mentioned electricity for hydrogen production, heating/cooling and other energy storage to replace oil and gas with new energy, chemical energy storage will be deployed in the power system on a large scale to completely replace fossil energy once the cost is affordable.

The translator adjusted the word order and sentence structure to make the translation conform more closely to English expression habits and enhance semantic coherence.

When translating 《工业操作手册》(Industrial Operating Manual), the translator used an intelligent CAT tool for post-editing:

Process:

AI translation → human editing → automatic QA check → manual error quality detection.

Strategy:

By optimizing translation prompts, ensuring that the translation conforms to the terminology and style requirements of the specific field while avoiding repeated revision.

Through this mode, translators can quickly produce high-quality translations and significantly improve translation efficiency. The post-editing mode generates an initial draft through machine translation and then has it edited and optimized by humans, which can effectively improve translation efficiency while ensuring translation quality. In practice, translators need to make meticulous adjustments at the lexical, syntactic, and discourse levels,

combined with quality assessment and optimization strategies, in order to achieve the desired translation effect.

3.3 Customized Machine Translation

Customized machine translation is a method of adjusting a machine translation engine to suit the needs of a specific field, terminology, or style. It can effectively combine the efficiency of machine translation with the accuracy of human translation, thereby achieving a balance between translation efficiency and quality. Customized machine translation can improve translation accuracy and consistency by integrating translation memory (TM) and terminology lists. For example, by uploading a company-specific terminology list, the machine translation engine can translate according to the established terminology conventions, thereby reducing the workload of later human editing. It is also possible to select an appropriate machine translation engine according to the characteristics of the industry. Life science companies can use specialized medical MT engines to reduce technical errors. In addition, fine-tuning pre-trained models through techniques such as low-rank adapters (LoRA) can further improve translation quality^[11]. Quality benchmarks and regular feedback mechanisms should be established to continuously improve the translation workflow. By evaluating the output quality of machine translation, the translation engine and editing strategies can be continuously optimized.

Human editors adjusted the word order and sentence structure to make the translation conform more closely to English expression habits and enhance semantic coherence. In terms of corporate applications of customized translation, both Bluebeam and Vimeo are trying to use customized machine translation engines to handle technical support materials and user documents, for example:

Bluebeam:

By using a workflow combining machine translation with later human editing, the turnaround time was shortened from an average of nine days to five days.

Vimeo:

Vimeo invested in customized MT engine training and achieved satisfactory results in the translation of support content.

Both companies emphasized the importance of human editing to ensure translation accuracy and brand consistency. Customized machine translation, by combining the efficiency of machine translation with the accuracy of human translation, can effectively improve translation efficiency and quality. By making use of translation memory, selecting appropriate machine

translation engines, combining later human editing, and implementing quality assurance processes, a balance between translation efficiency and quality can be achieved. Recent translation practice cases show that customized machine translation has achieved remarkable results both in the translation of energy-related texts and in the translation of corporate technical support materials.

3.4 Creative Intervention of Human Translation

In translation practice, the creative intervention of human translation is the key to achieving a balance between machine translation and human translation. Through creative editing by humans, the shortcomings of machine translation in semantic understanding, logical coherence, and cultural adaptability can be compensated for, thereby improving the overall quality of translation. Machine translation may not be able to accurately understand the context and metaphors of the original text, so during human intervention it is necessary to carefully analyze the context to ensure translation accuracy. For example, when translating the word “风口”, machine translation may render it literally as "tuyere" or "windfall", but human translation, combining the context, renders it as "the most competitive power battery", which better fits the context of the original. For professional terminology and complex expressions, human translation can optimize them according to the specific field. For example, in the energy field, human translation can choose more appropriate terms according to the context, such as "low-permeability depressurization injection system". Machine translation may be deficient at the syntactic level, and human translation can make the translation conform more closely to the expression habits of the target language by adjusting the word order and optimizing the sentence structure. Subjectless sentences are used frequently in Chinese; machine translation usually translates them directly, whereas human translation can optimize the translation by adding a subject or changing the sentence pattern. For example, when translating “鼓励和复制……商业模式”, human translation renders it as "Great energy will be channeled into encouraging and replicating.....", making the logic clearer.

When translating the paper 《海上风电支撑我国能源转型发展的思考》^[8], the translator handled the subjectless sentences creatively. For example:

Source:

“四是打造‘电为核心能源体系’三个区域示范。鼓励和复制……商业模式，推广化石能源替代示范。”

Machine translation:

Fourth, we will build three regional demonstrations of “electricity as the core energy system”. Encourage and copy.....

Human post-editing:

The fourth is to establish three demonstration zones characterized by electricity-centered energy system. Great energy will be channeled into encouraging and replicating.....

Through adding a subject and changing the sentence pattern, human translation makes the logic of the translation clearer and avoids the literal-translation problem of machine translation. Through the creative intervention of human translation, the shortcomings of machine translation can be effectively compensated for, thereby achieving a balance between translation efficiency and quality. The specific methods include contextual understanding and metaphor handling, optimizing terminology and expressions, syntactic adjustment and logical optimization, and the handling of subjectless sentences. The creative intervention of human translation can be effectively combined with machine translation to achieve balance.

IV. CONCLUSION

Machine translation can process large amounts of text quickly, saving time for human translation and allowing translators to focus on complex sentences or professional terminology that require fine adjustment. Human translation can compensate for the shortcomings of machine translation in understanding complex contexts and cultural backgrounds, ensuring that the final translation conforms to the habits and cultural background of the target language. By reducing the workload of human translation, translation costs are lowered while a relatively high translation quality is maintained. Through customized machine translation engines, combined with field-specific terminology lists and translation memory databases, the accuracy and consistency of translation can be further improved. Platforms such as Weglot, by combining machine translation with human review functions, achieve a balanced approach that ensures both speed and accuracy. Regularly evaluating the output quality of machine translation and optimizing it according to feedback continuously improves the performance of the translation engine. The effective combination of machine translation and human translation can not only improve translation efficiency and quality but also reduce costs and adapt to changing market demands. This collaborative working model is mainly realized through 1. hybrid translation mode; 2. post-editing; 3. customized machine translation; 4. creative intervention of human translation, and is likely

to be a major trend in the modern translation industry, helping to promote the overall development of translation services.

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