
Original Research Article

A comparative study of machine translation and human translation in English versions of Chinese official documents

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Abstract: This paper focuses on the performance differences between machine translation and human translation in the English versions of Chinese official documents. By collecting a large number of Chinese official documents along with their corresponding machine-translated and human-translated English versions, a thorough comparative analysis is conducted from multiple dimensions, including lexical accuracy, grammatical correctness, semantic coherence, and stylistic appropriateness. The study finds that while machine translation exhibits high efficiency and acceptable accuracy in handling conventional vocabulary and simple sentence structures, it significantly falls short in accurately translating specialized terminology, processing complex sentence structures, and conveying cultural connotations. In contrast, human translators leverage their profound language skills, cultural background knowledge, and flexible translation strategies to more precisely convey the original information, ensuring the quality and style of the translation align closely with the requirements of official documents. This research aims to provide valuable references for translation practices and related studies, fostering the improvement of machine translation technologies and the collaborative development of human and machine translation.

Keywords: machine translation; human translation; Chinese official documents; English version; comparative study

1. Introduction

With the acceleration of globalization, the English translation of Chinese official documents plays a pivotal role in international communication, diplomatic affairs, and international cooperation. Accurate translations ensure the effective transmission of information, preventing misunderstandings arising from linguistic discrepancies. In recent years, machine translation technology has made significant strides, with its efficiency and convenience leading to widespread adoption in the translation field. However, the quality of machine translation still lags behind that of human translation, particularly in text types like Chinese official documents that demand extreme accuracy, standardization, and rigor. Therefore, conducting a comparative study on machine translation and human translation in the English versions of Chinese official documents holds substantial practical significance.

2. Literature review

2.1. Current status of machine translation research

Machine translation has evolved from rule-based approaches, relying on manually crafted grammatical and semantic rules that showed limited effectiveness in handling complex linguistic structures, to statistical-based methods that analyze large bilingual corpora to learn translation patterns, enhancing accuracy and fluency. The advent of neural network-based machine translation, particularly with the application of deep learning techniques, has marked a significant breakthrough in natural language processing, enabling better capture of semantic and contextual information.

2.2. Current status of human translation research

Human translation research encompasses various aspects, including translation theories, strategies, and techniques. Theories such as functional equivalence theory, which emphasizes functional rather than formal

correspondence between the source and target texts, and skopos theory, which posits translation as a purposeful activity where the target text should fulfill specific communicative goals, guide human translation practices. In terms of strategies and techniques, scholars have explored how to select appropriate translation methods, such as literal translation, free translation, amplification, and omission, based on different text types and translation purposes.

2.3. Current status of comparative research between machine translation and human translation

Several studies have compared machine translation and human translation, often focusing on overall translation quality assessments through manual scoring or automated evaluation metrics. Nevertheless, comparative research specifically targeting the English versions of Chinese official documents remains relatively scarce, with existing studies requiring further expansion in terms of dimensions and depth.

3. Research methodology

3.1. Corpus collection

This study collected a substantial number of Chinese official documents, encompassing various types such as government work reports, policies and regulations, and diplomatic statements.

3.2. Determination of evaluation dimensions

To comprehensively and systematically compare machine translation and human translation in the English versions of Chinese official documents, the following evaluation dimensions were established:

Lexical Accuracy: Examining whether the chosen vocabulary in the translation is accurate, adheres to English expression norms, and aligns semantically with the original text.

Grammatical Correctness: Checking for grammatical errors in the translation, including issues related to tense, voice, subject-verb agreement, and part-of-speech usage.

Semantic Coherence: Assessing the degree of semantic coherence in the translation, evaluating its ability to clearly and accurately convey the original information and the logical relationships between sentences and paragraphs.

Stylistic Appropriateness: Considering whether the translation aligns with the stylistic characteristics of Chinese official documents, such as formality, rigor, and solemnity, and reflects their authority.

3.3. Evaluation methods

A combination of manual and automated evaluation methods was employed. Manual evaluation was conducted by professionals with extensive translation experience, who scored the machine and human translations (on a scale of 0 to 10) based on the aforementioned dimensions and provided detailed evaluative comments. Automated evaluation primarily utilized common translation quality assessment metrics, such as the BLEU (Bilingual Evaluation Understudy) metric, which gauges translation quality by calculating the similarity between the translation and References translations.

4. Research results and analysis

4.1. Comparison of lexical accuracy

Human translators excelled in lexical accuracy. Professional translators were able to precisely select appropriate English vocabulary based on the context and semantics of Chinese official documents. For instance, when translating specialized political terms with Chinese characteristics like "Socialism with Chinese Characteristics", human translators accurately rendered the term, preserving its core concept and adhering to English expression conventions. In contrast, machine translation exhibited deficiencies in this area, with some tools providing literal translations like "Chinese-style socialism," which, while conveying a general meaning, lacked accuracy and standardization.

4.2. Comparison of grammatical correctness

Machine translation has shown improvement in grammatical correctness but still encounters errors when dealing with complex sentence structures. Chinese official documents frequently contain long and intricate

sentences with multiple clauses and modifiers. Human translators can skillfully analyze sentence structures and apply grammatical rules correctly in their translations. For example, when translating the sentence "We should adhere to the people-centered development philosophy and continuously promote the all-round development of people and the all-round progress of society", human translators produced grammatically correct and fluent translations. Machine translation, however, might make errors in handling clauses, leading to confusing sentence structures.

4.3. Comparison of semantic coherence

Semantic coherence is a crucial indicator of translation quality. Human translators demonstrated a superior ability to grasp the semantic logic of Chinese official documents, ensuring coherence and clarity in their translations. When translating policy and regulation documents, for instance, human translators paid close attention to the logical relationships between clauses, using appropriate connectives and transitional phrases to maintain coherence. In contrast, machine translation performed relatively weakly in this aspect, sometimes resulting in loose logical connections between sentences and incomplete information transmission. Automated evaluation using the BLEU metric revealed that human translations scored higher in semantic coherence.

5. Discussion

5.1. Advantages and disadvantages of machine translation

The advantage of machine translation lies in its efficiency and convenience, enabling the rapid processing of large volumes of text. It can provide relatively accurate translations for conventional vocabulary and simple sentence structures. However, its shortcomings are evident. In translating specialized terminology, machine translation often errs due to a lack of in-depth understanding of domain-specific knowledge.

When dealing with complex sentence structures and cultural connotations, it frequently fails to accurately capture the original semantics and logical relationships. Additionally, machine translation lacks the ability to control translation style, making it difficult to meet the high stylistic demands of Chinese official documents.

5.2. Advantages and challenges faced by human translation

Human translators possess the advantages of profound language skills, extensive cultural background knowledge, and flexible translation strategies. Professional translators can select appropriate translation methods and vocabulary based on different text types and translation purposes, ensuring translation accuracy and quality. They are also better equipped to capture the stylistic characteristics of Chinese official documents, aligning the translations with official requirements. Nevertheless, human translation faces challenges such as relatively lower efficiency, as large-scale translation tasks may require significant time to complete. Moreover, translation quality can be influenced by the individual translator's skill level and experience, leading to variations in translation outcomes among different translators.

5.3. Collaborative development of machine translation and human translation

To fully leverage the strengths of both machine translation and human translation and achieve their collaborative development, several approaches can be pursued. On one hand, machine translation's efficiency can be utilized for initial translations, followed by human review and revision to enhance translation efficiency and quality. On the other hand, human translators can focus their efforts on addressing complex issues that machine translation struggles with, such as precise translation of specialized terminology and conveyance of cultural connotations. Simultaneously, machine translation technology can incorporate feedback from human translation practices to continuously optimize and improve translation models, thereby enhancing translation quality.

6. Conclusion

Through a comparative analysis of machine translation and human translation in the English versions of Chinese official documents, this study concludes that human translation outperforms machine translation in terms of lexical accuracy, grammatical correctness, semantic coherence, and stylistic appropriateness. While machine translation demonstrates certain advantages in handling conventional vocabulary and simple sentence structures, it exhibits significant deficiencies when dealing with Chinese official documents, which demand

extreme accuracy, standardization, and rigor. However, both machine translation and human translation possess their respective strengths and limitations. Therefore, promoting their collaborative development in the future is essential to fully harness machine translation's efficiency and human translation's precision, thereby improving the quality of English translations of Chinese official documents and better serving international communication and cooperation.

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