An Empirical Study on Quality and Efficiency of Trados Studio in Translating Optoelectronic Texts

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As a typical scientific and technological text, the optoelectronic technology text is characterized by many professional terms, formal style, and strong language repetition. Based on the advantages of photoelectric text in Trados application, this research compares and analyzes machine-assisted translation and human translation in terms of translation time, mistranslation, missed translation, terminology errors, spelling errors, and inconsistencies in terminology/translation through experimental operations. The aim is to prove that using Trados for translation can greatly improve the quality and efficiency of translation. CAT technology plays an active role in improving translation quality and efficiency, and contributes to the further development of computer-assisted translation technology. Based on the empirical results, we should promote and apply the CAT technology system and give full play to its positive advantages in translation teaching and translation practice.

Keywords: Trados, computer-aided translation, optoelectronic technology text, translation quality and efficiency

Introduction

The rapid development of science and technology has greatly changed the way to live today. The scientific and technological achievements that are now widely used in society have led to the integration of disciplines. As we can see, the level of science and technology is constantly updated, and the speed of knowledge transfer and large-scale industrialization is getting faster and faster. As an important branch in the field of science and technology, optoelectronic technology plays an irreplaceable role in information acquisition, transmission, and processing. Therefore, the translation of optoelectronic technology texts is becoming more and more important in the field of science and technology translation.

However, this kind of text has many professional terms, formal style, much language repetition, and low readability, so it will be time-consuming and labor-intensive to use traditional human translation. However, in the domestic translation environment, the coverage and audience scope of machine-assisted translation technology are not large, and the proportion of skilled technicians in machine-assisted translation is relatively small. Therefore, few translators and scholars has proved how Trados can improve the quality and efficiency through practical operations.

Through practical exploration, this paper compares manual translation and Trados machine-assisted translation in terms of translation quality and translation efficiency, to prove that CAT technology has played a
significant role in improving translation quality and efficiency. The aim is to provide new ideas for the development and innovation of the whole translation market.

The Advantages of Machine-Assisted Translation in Photoelectric Technology Text

Features of Photoelectric Technology Text

Wide use of proper nouns and technical terms. In order to meet the needs of the market, new products are often born in the photoelectric field, followed by a large number of new professional terms. Using the Trados term library function can solve many terminology problems in translation.

Strict style, concise sentences, strong logic, high content repetition rate. Photoelectric text involves a wide range, but they all belong to the same profession, so they are often similar in expression habits and have a high degree of mutual repetition.

Less feelings involved. There are no exaggerated statements or flowery words in the text, and most of the expressions are plain and straight, which meets the requirements of Trados translation for text.

Advantages of Trados to Translate Photoelectric Texts

Avoid repeated translation and improve translation efficiency. For professional texts (science and technology, medicine, law), many sentences and words have a high repetition rate in the whole text, while Trados can help to translate those repetitive parts, so as to maintain the consistency of the translation, minimize the error range, and improve the efficiency.

Quick term query. Photoelectric text is highly professional and involves a wide range, and the frequency of new words appears is high. The Trados term library can accurately help to translate corresponding terms, thus saving the time for translators to query and translate related terms.

Pre-translation of memory bank. As a database to store previously translated sentences, paragraphs, or text sentence segments, the memory bank can automatically control the same or similar matching items stored in the memory bank when translating new documents. This means that we do not need to re-translate sentences, paragraphs, or fragments of text that have already been translated.

Keep the original format and keep the consistency of the translation. Optoelectronic text is usually in a variety of document formats, and with the help of Trados, the translation process does not need to deal with the visual form of the document. At the same time, photoelectric text translation usually has fixed formats and processes. On the basis of memory and terminology database, Trados can maintain unified terms and translation style, so as to improve the overall quality of translated documents.

Perfect proofreading function after translation. As one of the most important stages in the translation process, it is time-consuming and inefficient to rely only on manual proofreading. Trados is based on a powerful quality control (QA) function. With the help of this software, translators can automatically check the problems of missing translation, quality, and symbols, thus improving the overall efficiency. At the same time, Trados also shows strong compatibility for parallel proofreading of different texts.

Application of Trados in Photoelectric Text

In order to gain more effective information, I have gone through many relevant papers and found some shortcomings in the personnel arrangement, experimental process and tools used in manual and machine-assisted translation contrast experiments. Here I point out:
1. The translator’s educational background, their English and Chinese proficiency level and computer proficiency level are not in detail. If the four translators have different proficiency levels, the data generated in this experiment cannot be fair enough.

2. Before the formal translation, the author only arranges them to browse the original text without trial translation, which cannot completely guarantee that they are familiar with the translation content and entirely engaged in the translation at the same time. So the accuracy and objectiveness of the experimental results cannot be guaranteed.

3. The screen recording tool used by the author is Cam Studio, but there are some flaws in the use of Cam studio, which will affect the entire translation process. For example: If the patch is not installed, normal recording cannot be performed. Only Windows system is supported, and the feasible formats are only .AVI and .SWF.

Experimental Design

Pre-translation

**Translator arrangement.** 4 interpreters were arranged for this experiment, and they were divided into two groups. T1 and T2 were Group 1 (human group), and H1 and H2 were Group 2 (Trados group).

The four interpreters involved in this experiment are all second-year graduate students of English Translation major in University of Shanghai for Science and Technology, and have successfully finished the two courses of computer-aided translation and term management, which indicates that they are skilled in using Trados.

At the same time, these four students are between 23 and 25 years old, so they have a certain understanding of the entire social culture. And they are all born and raised in China with IELTS scores ranging from 7 to 7.5. In this connection, they can use Chinese and English proficiently; their translation level can basically reach the professional level. Moreover, they all have computer second-level certificate, so there are no technical problems in the use of computers.

One of the four translators is selected to record the translation time and review time of each translator, as well as the collection and sorting of data.

**Translation tool.** As SDL Trados 2014 Studio is one of the most common computer-aided translation tools and accounts for 70% of the global machine-aided translation market share, it is chosen as the translation tool for this project. The installation package includes SDL Trados’ Winalign, SDL Multiterm, and Linescan Workbench.

**The original text.** The original text selected for this project is Application Form of Photoelectric Project, and the text type is Word document, which is characterized by simple sentence structure, high repetition rate, and a large number of professional terms. At the same time, the original text provider also provides related terminology and memory banks.

For convenience, the project text is named Project 1. Before started, the translator imported this project into SDL Trados Studio 2014 for statistics such as numbers, matching information, and repeated segments. According to the default matching threshold of Trados, the following table only counts sentences with a matching degree greater than 75% (including 100%), and the counted words are English words:
Table 1

| Data Analysis of Project 1   |
|-----------------------------|
| Contains files | 3 |
| The total number of words | 6,386 |
| Repeat sentence paragraph | 38 |
| Match rate (> 75%)      | 14 |
| Repeat sentence segments between files | 72 |

**Screen recording tool.** The screen recording tool used in the relevant paper is Cam Studio, but after many trials, the following shortcomings are found in Cam Studio:

1. Cam Studio runs erratically and is often used with notifications that patches need to be installed, which can affect the entire translation process.
2. Cam Studio offers limited editing options without installing third-party extensions, so converting to the target format can be a struggle.
3. Based on these shortcomings, I found a more complete screen recording tool FRAPS. FRAPS can be downloaded directly without installing patches, so it will not take up more computer memory, and can run smoothly in without affecting the entire translation process, and can directly export videos without paying. FRAPS can record all the operations of the user to provide help for the analysis of the recorded data.

**Trial translation.** In order to be familiar with the entire translation process, this experiment arranged two groups of people for trial translation. The text of the trial translation is similar to the original text. The second group uses Trados to try to translate 200 words with the help of TM, and uses screen recording to record the data. The first group also needs trial translation. The text of the trial translation is the same as that of the first group. The auxiliary tools can be Youdao Translation, Google Translate, Encyclopedia, Wikipedia, and other electronic online dictionaries.

The computers for the four translators are all Lenovo Air 14, and there is no difference in computer performance, and they are tested in the same classroom with stable network operation.

**During Translation**

In order to be fair enough, there are two people in each group. Therefore, the original text with 6,386 words is divided into two, and the average number of words to be translated per person is about 3,193 words.

1. Manual group: Open the project file (.doc) to be translated, open the required dictionary, and start translation.
2. Trados group: Create a project on Trados, name it Project 1, add project file (.sdlxliff), add memory bank, add term database, pre-translation, then enter the translation editor interface, open the segment for translation.

The two groups of people opened the screen recording software and clicked start when they started the translation, and clicked the end button when they finished the translation, so as to record the time consumed by the translation project for subsequent analysis of the translation data results.

**After Translation**

After finishing the translation, the translator needs to do the proofreading. First of all, the software can be used to conduct a preliminary review of spelling and capitalization. After that, the translated text needs to be
exported and handed over to the team member in charge of reviewing, and the text needs to be checked again. After the reviewer finishes the review, it should be sent back to the interpreter for re-inspection. The proofreading time is collected manually by each translator. In addition to the time difference that needs to be recorded by the screen recording software in the process of review, every project and every file’s mistranslations, omissions, terminology errors, spelling errors, inconsistent terminology/translation, and other problems need to be taken manually by the translator.

**Comparative Analysis of Translation Data**

The results of this experiment will be compared and analyzed from two aspects: translation efficiency and translation quality.

**Comparison of Translation Efficiency Data**

The translation time is the time consumed by the translation project, and the review time is the time consumed by the translator after the translation of the project is completed. The actual total time is the sum of the translation time and the review time. The units are minutes and seconds.

The formula of translation efficiency is speed/word count (S/W). Given that only two groups of data are obtained, namely time and word count, the formula can be transformed into S/W = translation time/total word count.

**Table 2**

|                     | Manuel group | Trados group |
|---------------------|--------------|--------------|
|                     | H1 | H2 | Total time | T1 | T | Total time |
| Translation time (minutes) | 183 | 196 | 379 | 110 | 124 | 234 |
| Proofreading time (minutes) | 142 | 144 | 286 | 54 | 47 | 101 |

According to the formula and data given, the translation efficiency improved by using Trados in this project is calculated:

Manuel group: \((379 + 286) ÷ 6,386 = 0.104\),

Trados group: \((234 + 101) ÷ 6,386 = 0.052\).

Therefore, the efficiency of the manual group is 10.4%, which means that it takes 0.104 minutes to translate a word; the efficiency of the Trados group is 5.2%, which means that it takes 0.052 minutes to translate a word.

Conclusion: Compared with traditional human translation, the efficiency of translation combined with Trados can be improved by half. The higher the text repetition rate, the higher the efficiency of Trados translation.

**Comparison of Translation Quality Data**

LISA QA Model is a quality model established by the international authoritative translation quality standards organization, the Localization Industry Standards Association (LISA) based on the best practices, and
recommendations of its member companies through basic statistical models. This model lists the error categories, severity and weight, etc., which provides a good basis for the standardization of quality management in the translation industry.

Based on the LISA Quality Assurance Model and China’s “Translation Service Translation Quality Requirements”, this article intends to correct the terminology error (Wrong Term), wrong translation (Wrong Meaning), omission (Omission), term/translation inconsistency (Inconsistency Term/Inconsistency) Segment, spelling mistakes (Spelling Mis-take), punctuation errors (Punctuation Error), and other seven aspects as the basic elements of translation quality inspection. It should be noted that due to technical reasons, subjective factors such as authenticity and aesthetics of the translation have not been considered in the evaluation.

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Table 3

|                  | Manuel group | Trados group |
|------------------|--------------|--------------|
|                  | H1           | H2           | T1   | T2   | The average |
| Terminology error| 7            | 4            | 0    | 0    | 0            |
| Mistranslation   | 11           | 15           | 9    | 13   | 11           |
| Missed translation| 3           | 2            | 0    | 0    | 0            |
| Inconsistent terminology| 8           | 4            | 1    | 0    | 0.5          |
| Spelling mistakes| 5            | 4            | 5    | 7    | 6            |
| Punctuation error| 2            | 4            | 0    | 1    | 0.5          |

By comparison, there were no terminology errors, translation errors, and punctuation errors in the Trados group. This is because Trados itself has the function of a quality inspection system, which automatically checks sentence paragraphs, target terms, and punctuation marks when confirming the translation of sentence paragraphs. Although a terminology bank is provided, human translation requires a corresponding search for each term, so human error is inevitable.

These four translators hardly know the background knowledge of this project, but they can quickly master the professional knowledge and norms of related fields when using Trados. This is due to the vocabularies provided by customers, so as to reduce the chance of mistakes and ensure the translation compliance.

From this comparative analysis, it can be concluded that Trados can completely avoid low-level errors (such as mistranslations, numbers, punctuation errors, etc.) in the translation process, and ensure the consistency of key terms and the same sentence paragraph to the greatest extent. Using Trados to translate photoelectric text has high efficiency and quality advantages that human translation is difficult to achieve.
Conclusion

Based on large database and corpus, machine translation technology provides technical support for traditional human translation. The development of science and technology promotes the effective combination of machine translation and human translation, which not only improves the quality and efficiency of translation, but also promotes the further development of computer-aided translation technology. We should follow the trend of information globalization, draw lessons from the existing achievements of translation market in developed countries, vigorously develop, popularize, and apply CAT technology system, and give full play to the advantages of modern translation technology in translation teaching and practice.

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