

Exploring the Innovative Application of Computer-Aided Translation in English Translation of Humanities Works

Minghui Tong

Air Force Engineering University, Xi'an, Shaanxi 710051, China

Keywords: Humanities Works; Computer-aided translation; English translation; Accuracy

Abstract: With the rapid development of the network, modern humanities works spread faster and faster around the world, which requires the overall efficiency of the translation industry, computer-aided translation technology and tools. After a brief introduction to computer-aided translation technology, this paper analyzes the shortcomings of contemporary humanities translation in terms of timeliness, teamwork, professional vocabulary, literary emotional management, quality control. And this paper explains how to use computer-aided translation tools in the translation of humanities works, which improves translation efficiency and accuracy.

1. Introduction

With the continuous development of Internet technology, the trend of economic and social globalization has become more and more obvious, and modern humanities works have been widely spread around the world [1-2]. Translation is an indispensable factor in the dissemination of humanities. With the accelerated pace of people's life and the development of information technology, the traditional manual translation model has been unable to meet the growing demand for documents. People gradually enter the network era, and the use of computer technology to achieve automatic translation of modern humanities works has become the main trend of the development of the current translation industry.

The rapid development of current technologies such as computers, cloud computing, and the Internet of Things has greatly promoted technological changes in the translation industry. Machine translation can promote the mutual translation of multiple languages and promote the spread of humanities works around the world [3]. In the process of translation, artificial intelligence technology is applied to realize synchronous speech translation. Therefore, cloud computing can be provided by cloud computing of big data to construct a personal cloud, which share translation library to improve the synchronization and accuracy of translation [4-5].

2. Innovative application of computer-aided translation

Computer translation, including computer-aided technology (CAT) and machine translation, has been developed relatively quickly, but computer-aided technology is supplemented by manual in the translation process, which is better than machine translation and can be applied to statistics and examples. The widespread use of these software tools has changed the traditional translation model and effectively improved the efficiency of translators [6-7].

The computer-assisted translation process can help improve translation efficiency, including machine translation, translation memory matching technology, translation analysis technology, translation format conversion technology, translation quality control technology and terminology management technology [8]. Taking the translation of human works as an example, computer-assisted translation can achieve twice the result with half the effort. Its role is shown in Figure 1 [9].

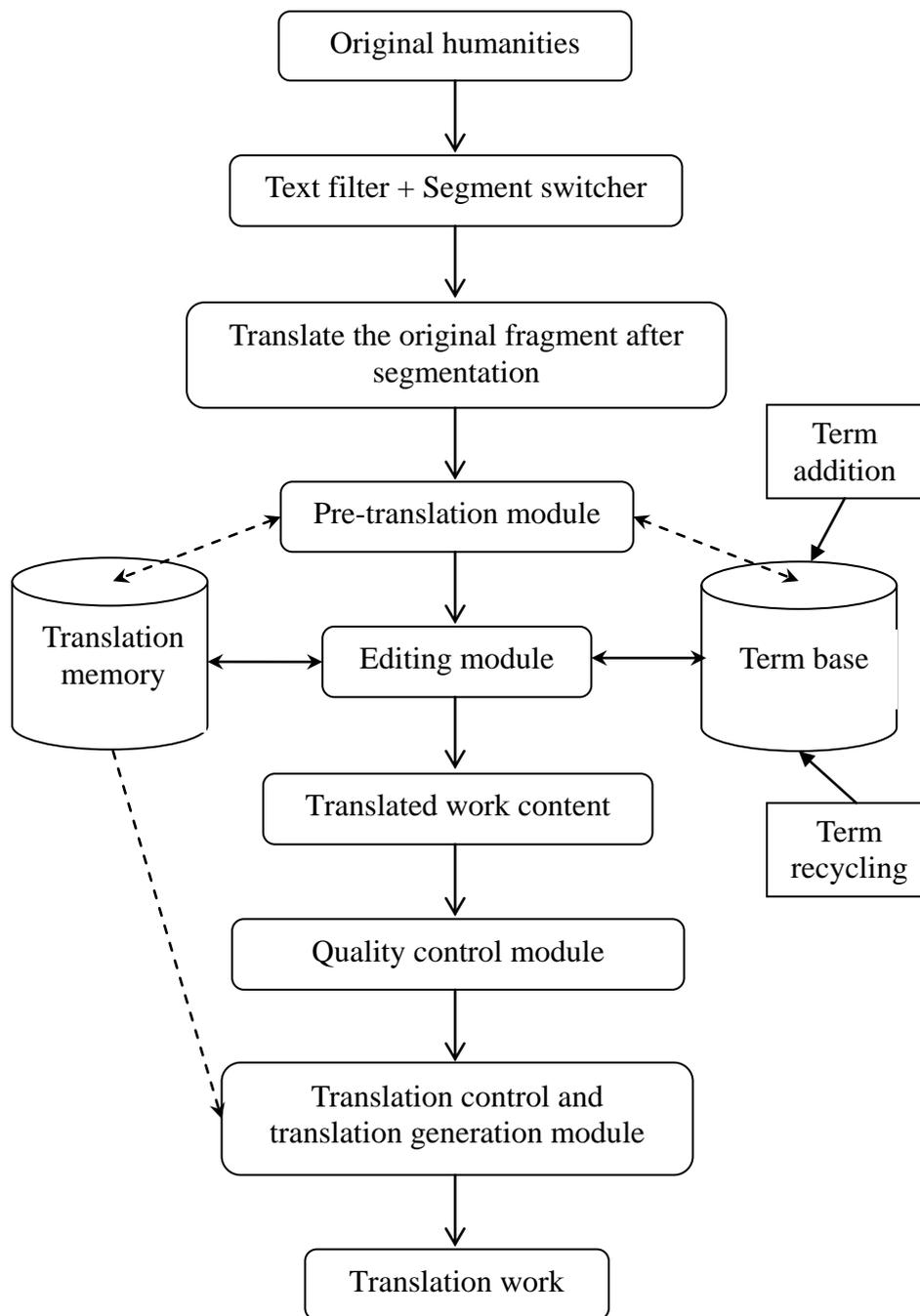


Figure 1 The basic structure of computer-aided translation technology in the translation process of humanities

3. The application of computer-aided translation technology in the translation process of humanities works

This paper proposes a framework for computer-aided translation technology evaluation. The implementation of the framework is divided into four steps: the first step is to build a computer-aided translation tool quantity model; the second step is to build a user demand model; the third step is to prepare Evaluation; the fourth step is to perform the assessment, as shown in Figure 2 [10].

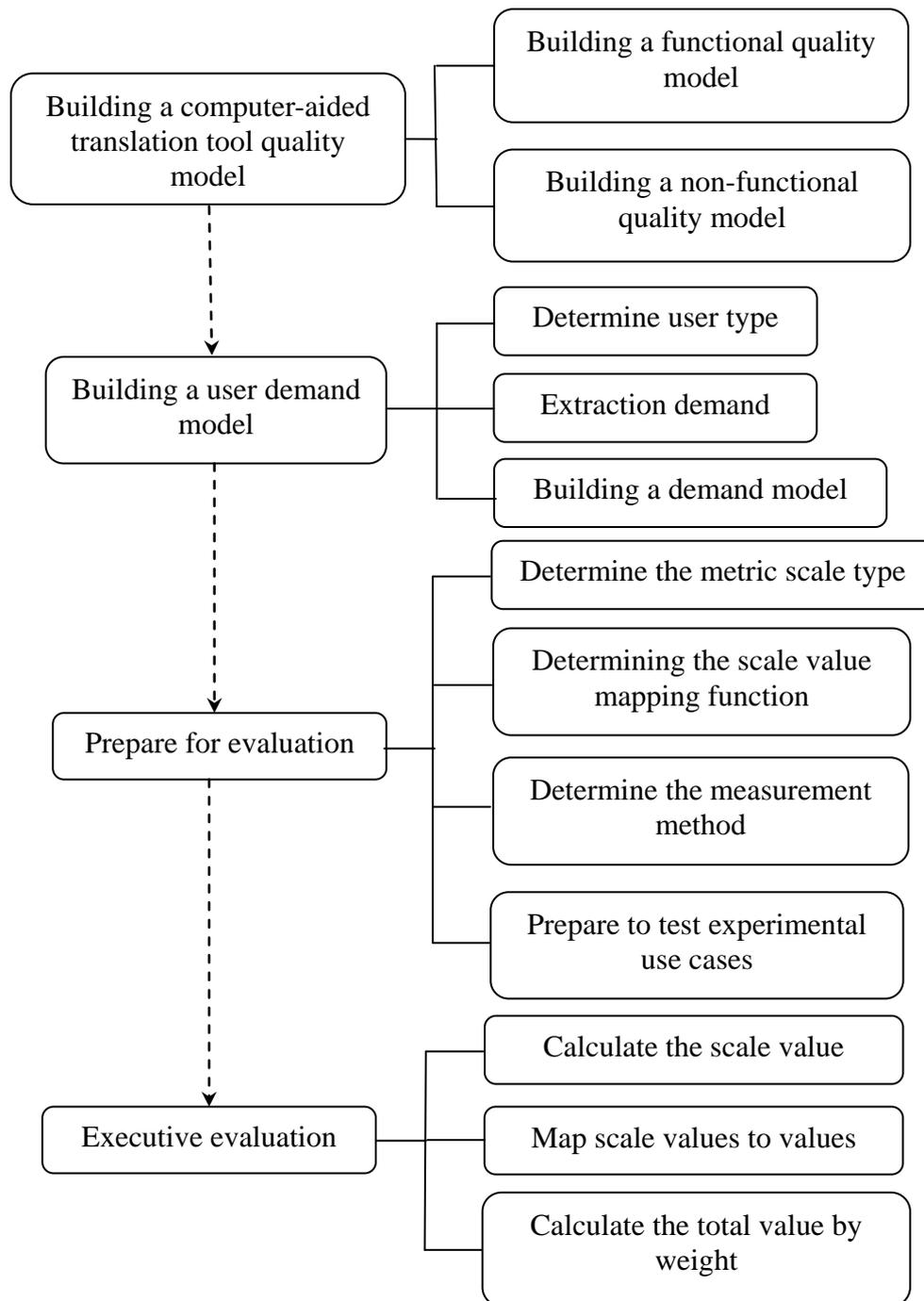


Figure 2 The framework of computer-aided translation technology assessment

3.1 Building a computer-aided translation tool quality model

The prerequisite for evaluating the quality of computer-assisted translation tools is to define an overall quality model for computer-assisted translation tools. Once the quality model is built, a systematic and accurate description of the computer-assisted translation tools can be made. The quality requirements correspond to the other five sub-characteristics in the quality model. In general, the description of the overall function of a computer-assisted translation tool can be made up of two sources, one is the function of the existing computer-assisted translation tool; the other is the user's expectation that the computer-assisted translation tool can provide the function. From these two aspects, the attributes of many computer-assisted translation tools will be obtained. For the convenience of evaluation, these attributes need to be classified in a certain level.

We decompose computer-aided translation tool functions into tasks, and for those tasks that are relatively incapable of performing independently, they need to continue to decompose until they are

broken down into subtasks that can be directly executed. Assuming that all functions of the computer-assisted translation tool are T. T can be decomposed into T_1 - T_n . Take T_1 as an example, because it is a combined task, it needs to be further broken down into sub-tasks T_{1-1} and T_{1-2} that can be executed independently. Take the possible task model as an example, and perform the decomposition example, as shown in Table 1.

Table 1 A possible task model

Task	Subtasks	Task number
Project management	Project supervision	T_1
Preparation before translation	Preparing Files	T_2
	Number of words	T_3
	Pre-translation	T_4
	Prepare translation memory	T_5
	Extract terms	T_6
	Recycling term	T_7
Translation	Interact with the translation memory	T_8
	Interact with term bases	T_9
	Interact with the editor	T_{10}
Post-translation processing	Quality guarantee	T_{11}
	Generate translation	T_{12}
Language asset maintenance	Translation memory maintenance	T_{13}
	Term maintenance	T_{14}

3.2 Building a User Demand Model

There are two methods for constructing the demand model. One is based on the information extracted above, and the experienced evaluator directly gives the user the demand model. The other is to ask each of the typical users of the same user type to give their own. The demand model is then averaged over these demand weights (and, if necessary, experienced evaluators are sometimes fine-tuned based on the extracted information). Take a possible demand model as an example, as shown in Table 2.

Table 2 A possible user demand model

Task number	Weights
T_1	0.1
T_2	0.03
T_3	0.05
T_4	0.15
T_5	0.02
T_6	0.1
T_7	0.03
T_8	0.05
T_9	0.15
T_{10}	0.05
T_{11}	0.05
T_{12}	0.1
T_{13}	0.05
T_{14}	0.05
Total	1

3.3 Implementation assessment

The computer-aided translation quality model and user model are constructed, and the relevant preparation for measurement is completed. The final step is to perform the evaluation. The values of each scale are obtained according to the experiment designed in the previous step.

In this step you will need to use some decision theory to choose the right tool. A comprehensive comparison found that the Linear Weighted Attribute Model method, which mentioned by Fritz and Carter (1994) in their summary report on software evaluation and selection method is more suitable for computer-aided translation evaluation. The dates are shown in Table 3 and Table 4.

Table 3 Two CAT tool metric scores and mapping examples

Measure \ Tool	Tool	Conversion Value	CAT Tool 2	Conversion Value
Whether to support AutoCAD format	No	0	Yes	100
Automatic alignment accuracy	97%	97	80%	80

Table 4 Example of a demand model

Measure	Weights
Whether to support AutoCAD format	0.2
Automatic alignment accuracy	0.8

5. Conclusion

Modern humanities writings are spreading faster and faster around the world, so it is necessary to effectively improve translation quality and translation efficiency. In the translation industry, the professional skills of translators and the ability to use modern tools should be constantly improved. Computer-aided translation technology fully combines the advantages of machine translation and human translation, and can scientifically control the whole process of translation to significantly improve translation efficiency and translation accuracy.

References

- [1] Fukui D , Wada Y , Komatsu K , et al. Innovative Application of Available Stent Grafts in Japan in Aortic Aneurysm Treatment—Significance of Innovative Debranching and Chimney Method and Coil Embolization Procedure[J]. *Annals of Vascular Diseases*, 2013, 6(3):601.
- [2] Duarte J F. The trials of translation: from global cultural flow to domestic relocation[J]. *Journal of Romance Studies*, 2011, 11(1):49-60.
- [3] Rodríguez-Castro M. An integrated curricular design for computer-assisted translation tools: developing technical expertise[J]. *Interpreter & Translator Trainer*, 2018, 12(1):1-20.
- [4] Huang C C , Chen M H , Yang P C , et al. A Computer-Assisted Translation and Writing System[J]. *ACM Transactions on Asian Language Information Processing*, 2013, 12(4):1-20.
- [5] Fan L. English as lingua academica: The case of the Chinese Translation Fund for the Humanities and Social Sciences[J]. *Translator*, 2017, 23(4):428-440.
- [6] Su W, Li D. Corpus-Based Studies of Translational Chinese in English–Chinese Translation (2015). Richard Xiao and Xianyao Hu.[J]. *Digital Scholarship in the Humanities*, 2016, 31(3):516-519.
- [7] Hammouda S. Small Parallel Corpora in an English-arabic Translation Classroom: no need to reinvent the wheel in the era of globalization[J]. *Journal of Biochemistry*, 2010, 88(6):1577-86.

- [8] Fudge T A. Two Revisions of Rolle's English Psalter Commentary and the Related Canticles, Vol. 1 ed. by Anne Hudson (review)[J]. *Parergon*, 2013, 30(2):246-247.
- [9] Wilkinson A S. Vernacular translation in Renaissance France, Spain, Portugal and Britain: a comparative survey[J]. *Renaissance Studies*, 2015, 29(1):19-35.
- [10] Applegate C. Goethe and Zelter: Musical Dialogues. By Lorraine Byrne Bodley.[J]. *Music & Letters*, 2012, 93(1):123-126.