Analysis on Machine Translation of Data News Based on Translation Typology in Functionalism

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Abstract—with the advent of the data age, data news appeared as a new form of reporting. Driven by big data technology, data news has made a qualitative and quantitative leap. Some machine translation tools are frequently used to translate the data news to get newest data information, especially some online translation websites. Whether machine translation can replace real translators? Based on translation typology in functionalism, this essay mainly compares different machine translation versions of data news, and the essay mainly focuses on the translation versions from two online translation websites, namely fanyi.baidu.com, translate.google.cn. And the essay finds out that there are some mistakes, namely mistranslation, and omitted translation in these machine translation versions which needs further correction and polishing by the translators and optimization of these websites.

Keywords- big data; data news; machine translation; translation typology in functionalism

I. INTRODUCTION

With quick-developing technology and science, and circulation of information, big data is the result of the high-technology period. Some data are revealed in the form of data news reports, to relevant professionals, the public, or anyone worldwide who are in need of the data. Therefore, it is of great necessity to translate the data news. Machine translation tools are frequently made use of, especially some online translation websites. Whether machine translation can replace real translators are in a hot debate. Based on translation typology in functionalism, this essay mainly compares different machine translation versions of data news, and the essay mainly focuses on the translation versions from two online translation websites, namely fanyi.baidu.com, translate.google.cn.

II. BACKGROUND

A. Data News

Data news, which is also known as data-driven news. It is a new method of news reporting, which is on account of big data capture, mining, statistics, analysis and visualization. Driven by big data technology, data news has made a qualitative and quantitative leap. News is now closely connected with big data technology, therefore, data news is a natural result. The appearance of data news has been greatly changing the traditional news industry.

Up till now, the media companies worldwide that have got experience in big data news consist of *The Washington Post*, *The New York Times,* and *The Guardian*, but they are also in the exploratory stage. Through the research on the big data news practice of representative media at home and abroad, we can summarize the four functions of big data news, namely description, judgment, prediction and information customization. And the features of data news include the following four aspects:

- To serve the public interest;

- Based on public data;

- Relying on the special software program to process the data, mining the news stories hidden behind the macro and abstract data;

- Present news in a visual way of image interaction.

B. Machine Translation

Machine translation (automatic translation), which is the course of transferring two natural languages, one of which is the source language, and the other is called the target language through computers. One of the final aims of AI (artificial intelligence) is realize the perfection of machine translation, which is a part of computational linguistics. It is of significant both research and practical value. As the fast growth of globalization economically and the development of the Internet, the technology of machine translation leads an more and more vital part in pushing global communications and exchanges in every aspect, namely politics, economy and culture.

Machine translation has gone through several phases. At the beginning, is was matching using dictionary, and then connected with linguists' professionals' knowledge, Rule-Based dictionary translation appeared, and after that, thanks to corpus, machine translation developed to the statistical level. Right now, it has already no longer limited to the campus, but the development of computing power of the computers and the great increase of multilingual information, all the people can enjoy the real-time and convenient translation experiences.

In view of the fact that there is still a considerable market for machine translation, there are many Chinese manufacturers involved in this field. The translation software products on the domestic market can be divided into four categories: full text translation (professional translation), online translation,

Chinese software and electronic dictionary. Internet machine translation system are based on big data, such as Baidu translation, and Google translation. This essay mainly compares the translation versions of these two online translation tools.

C. Machine Translation of Data News

Searched in the frequently-used searching engines, few researches has been carried out in the area of machine translation of data news. Therefore, this essay will serve as a catalyst and have some reference value for further study on this area.

III. TRANSLATION TYPOLOGY IN FUNCTIONALISM

After 1950s, functionalist translation theory appear, which was led by famous linguist Catharina Reiss. What is function? "Function is meaning", and meaning is the concept and content of the text. Different functions of texts determine different translation strategies. Functionalist translation theory provides a new perspective for people to explore translation, and Successfully developed static symbolism language translation to dynamic functional translation analysis for the translation theory, which put importance on the translation as a form of "transference of culture" and "interact communicatively".

Rice believes that translation should be based on the principle of equivalence and pay attention to equivalence at the textual level. She divides text into three types: informative text, expressive text and operative text. Data news also has different functions and can be classified according to text types.

The function of a particular text is not single, it may have several functions at the same time, such a text Rice called "compound type". Different functions may exist at the same time, or they may appear in different stages of the text, but even the compound text is always dominated by a certain function [1]. The following figure shows the different emphasis of various text functions:
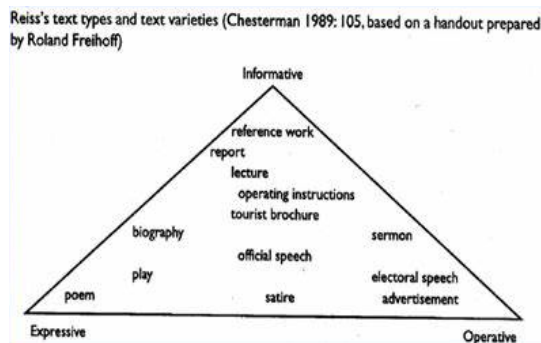

Figure 1.   Text types and varieties. [1]

Reiss not only divides texts into three types, but also illustrates the connection among different kinds of text types and translation methods generally. It put emphasized on translation, which is one special characteristic of this model. The classification of texts, the analysis of language functions, language features, communicative situations and information focus, all seek the rationale for translation strategies. According

to Reiss, informative texts mainly express facts, information, knowledge and opinions, their linguistic features are strong logicality, and the focus of the text is content rather than form [2]. Plain vernacular is in need when translating. In order to convey the attitude of the information giver to others, expressive text is of great use. Its language has aesthetic characteristics, focusing on the information sender and its sending form. In order to make the translation faithful to the original author or the original text, imitation should be adopted in the translation of expressive texts. Operational text aims at infecting or persuading readers and making them take certain actions. It is reader oriented and effect oriented. The essence of conversation is one part of its language form, and its focus is on the receiver of information and its influence on them. When translating operational texts, we can use compiling or adaptive methods to achieve the purpose of infecting readers.

In Reiss' model, the informative, expressive and operative types of language and text are synonymous with language use, while the poetic and metalinguistic functions of language are the characteristics of language itself, which are not synonymous with language use. Therefore, in fact, in the aspect of translation, the analysis of the text is equal to the analysis of the language function in a given context. And in accordance to predetermined function, proper translation tactics should be adopted.

TABLE I. TEXT TYPES [3]

Text type	Informative	Expressive	Operative
Language function	Informative (representing objects and facts)	Expressive (expressing sender's attitude)	Appellative (making an appeal to text receiver)
Language dimension	Logical	Aesthetic	Dialogic
Text focus	Content-focused	Form-focused	Appellative-focused
TT should	Transmit referential content	Transmit aesthetic form	Elicit desired response
Translation method	"plain prose", explicitation as required	"Identifying" method, adopt perspective of ST author	"Adaptive", equivalent effect

IV. RESEARCH TARGET AND RESEARCH METHODOLOGY

A. Research Target

In this essay, the research targets are 16 pieces of data news which are adopted from the website http://www.xinhuanet.com/datanews/ under the column of Data Observation, consisting of eco-friendly car, employment of talents and urban traffic.

B. Research Methodology

This essay is based on the theories of translation typology in functionalism with the quantitative methodology demonstrating the statistics of the text types of data news in the target website, the statistics of the translation versions from the two online translation websites fanyi.baidu.com, translate.google.cn obeying Reiss' TT should and translation

method in the table above, and the integration of qualitative research to compare the two translation versions and conclude a better way of translation.

V. RESEARCH RESULTS AND DISCUSSION

A. Cases of Text Types in the Research Target

TABLE II. DATA NEWS AND TEXT TYPES

Text Type	Informative	Expressive	Operative
Pieces of Data News	9	4	3

The table above shows the pieces of data news in the target website classified according to Reiss' text types in a general way. Actually, the text types of the contents in each piece of data news are not limited to just classification. However, according to different parts as well as various functions of the text, data news can be classified as different text types. This needs to be analyzed and handled according to different contexts and situations.

TABLE III. INFORMATIVE DATA NEWS AND TRANSLATIONS

Text Type	Informative	Translation Mistakes in fanyi.baidu.com	Translation Mistakes in translate.google.cn
Pieces of Data News	9		
TT Should	Transmit referential content	25	27
Translation Method	"Plain Prose", explicitation as required	25	27

TABLE IV. EXPRESSIVE DATA NEWS AND TRANSLATIONS

Text Type	Expressive	Translation Mistakes in fanyi.baidu.com	Translation Mistakes in translate.google.cn
Pieces of Data News	4		
TT Should	Transmit aesthetic form	16	17
Translation Method	"Identifying" method, adopt perspective of ST author	16	17

TABLE V. OPERATIVE DATA NEWS AND TRANSLATIONS

Text Type	Operative	Translation Mistakes in fanyi.baidu.com	Translation Mistakes in translate.google.cn
Pieces of Data News	3		
TT Should	Elicit desired response	7	9
Translation Method	"Adaptive", equivalent effect	7	9

The three tables respectively show the number of translation mistakes in the two target online translation websites for the data news of different text types. And we can find out that there are quite a number of mistakes in each situation. Next, the essay will raise a few examples to further illustrate the comparison of the two translation versions and conclude a better way of translation.

B. Analysis and Comparions of Machine Translation of Data News

The major target of informative text is to show information and knowledge. When translating information-based data news, we should use simple language to express the original meaning of the chart clearly. For example:

ST: 全球新冠肺炎确诊病例攀升过程

TT (a): Global Novel Coronavirus Pneumonia Confirmed Case Climbing Process (translated by Baidu)

TT (b): The Global Rise in Confirmed Cases of New Coronary Pneumonia (translated by Google)

We can see from the two translation versions above that translation version of Baidu is a word-to-word translation, some are even Chinese-style English which do not obey the rules of English, especially in the "Climbing Process" part. However, for the translation version of Google, it is generally correct except for the translation of the proper noun of which the official translation version is "Novel Coronavirus Pneumonia".

This piece of data news is informational. The translator only needs to translate the meaning of the original text. However, the rules of the target language and official translation versions of some proper nouns should be emphasized by the translators. This sentence could be translated as: The Global Rise in Confirmed Cases of Novel Coronary Pneumonia.

The expressive text mainly expresses the original author's writing attitude and position, and is mostly used in literary works. In the headlines of data news, sometimes there are some emphatic words to express the author's opinions. When we are translating, we should not overlook the function of these words, and be faithful to the original text and convey the author's attitude. For example, there is a paragraph in the data series of "Big Manufacturing Country -- 70 Years" that describes the data news in detail, in which the strong words are used to emphasize the rapid development of China in the data news. The description is as follows:

ST: 建立门类比较健全的工业体系

企业研发力量不断增强

研发成果日益丰硕

高技术装备类产品发展迅速

In this paragraph, the words "不断", "日益" and "迅速" appear. They all have the meaning of emphasis, which should be reflected in the translation; otherwise, they will not

be able to express the author's feelings. The two translation versions of the paragraph are as follows:

TT (a): Establish a sound industrial system

The R & D strength of enterprises is constantly enhanced

Increasingly fruitful R & D achievements

High tech equipment products are developing rapidly

(translated by Baidu)

TT (b): Establish a relatively sound industrial system

Corporate R&D capabilities continue to increase

R & D results are increasingly fruitful

High-tech equipment products are developing rapidly

(translated by Google)

In the translation, the first machine translator has used the word "constantly", and the second has used the word "continue to" to express the meaning of "不断". The two words of different parts of speech are both correct in meaning and grammar. However, the first version sounds more authentic. For the following two important expressions, the two online translation tools have both used the words "increasingly" and "rapidly" to express the author's feelings, not only faithful to the original, but also vivid.

The operative text mainly appeals to the readers and inspires them to take some action through the characteristics of dialogue. Data news sometimes has this kind of emotional color, in order to stimulate and infect the readers' emotion. The translator should also translate the emotional color of the original text, otherwise the translation will lose the author's intention to stimulate the reader's emotion. For example, the imperative sentence appears in the article of "Competing for the Excellent Graduates, the Attraction Ranking of Famous Internet Companies Came out":

ST: 不要眼高手低，但也不要"得过且过"。尽最大努力争取最好的 offer，职业起点高，以后会机遇更多。

TT (a): Don't be arrogant, but don't "muddle along". Try your best to get the best offer. The career starting point is high, and there will be more opportunities in the future. (translated by Baidu)

TT (b): Don't be superior and inferior, but don't "pass it by". Do your best to get the best offer, a high career starting point, there will be more opportunities in the future. (translated by Google)

The last few sentences in the news appear in the form of imperative sentences, mainly emphasizing that the author thinks that experts have high expectations for the career growth of graduates. The author hopes to arouse the readers' attention through imperative sentences. However, the last sentence will be more authentic with "The higher your career starting point is, the more opportunities there will be in the future".

VI. CONCLUSION

Translation is a complex language practice. It is important to solve such basic theoretical problems as translation objectives and translation standards, and it is also important to study and solve the practical problems with universality in the process of translation [4]. Many people have misunderstandings about machine translation. They think that machine translation is too biased to help people solve any problems. In fact, errors are inevitable. The reason is that machine translation uses linguistic principles to automatically recognize grammar, call the stored thesaurus, and automatically translate. However, errors are inevitable due to changes or irregularities in grammar, morphology, and syntax. After all, Chinese has very different meanings because of the changes of morphology, grammar, syntax and the change of context. Even many Chinese people are confused. If they can't understand, let alone machines.

In any case, at present, people are most optimistic about machine translation, which is based on an objective understanding and rational thinking. With the working-together of professionals from different fields, namely, linguists, logicians, psychologists, mathematicians and computer experts, the problem of machine translation will be possibly solved.

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