Editing Taiwan divination Verses with controlled Language Strategies: Machine-Translation-Mediated Effective Communication

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Abstract

Aimed at fostering machine-translation-mediated communication across languages and cultures, this paper proposes editing Taiwan divination verses from the natural into controlled language to improve the comprehensibility of machine translation (MT) outputs. After editing 160 divination verses, and evaluating the semantic and grammatical accuracy of their English MTs that are produced by online Google Translate (a neural MT system for free), the author has identified several controlled language strategies. The lexical strategies include replacement of archaic Chinese words with vernacular Chinese ones, paraphrasing of culture references and insertion of explanations for metaphors. Grammatical strategies are the use of articles, determiners and possessive cases, and syntactical ones include the addition of conjunctions and the restoration of missing subjects or/and objects. The MT outputs of edited and unedited divination verses are compared. The findings show that the English MT outputs of edited texts have greatly improved their semantic, grammatical and syntactic accuracy, so the effectiveness of controlled language strategies is justified. Due to the effectiveness of editing verses with controlled language strategies, the goal of MT-enabled web-based communication across cultures is achieved. The practical significance is also discussed including culture acquisition and cost reduction.

Keywords: controlled language, divination verses, MT, comprehensibility, web-based communication

1. Introduction

In the era of globalization, advanced computing technologies make us able to access information of various subjects on the Internet. However, web-based information that is not presented in the audiences' native languages can be an obstacle to effective communication. Fortunately, the online neural machine translation (NMT) systems have improved their translation quality over time using the techniques of AI, data analysis and deep learning. Despite the better machine translation (MT) quality, the NMT system still cannot handle the translations of specialized terms, archaic words, proper nouns, cultural references and complex, long sentences. To address this issue, we can use post-editing to amend MT errors or pre-editing to reduce MT errors.

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For web audiences who want to get real time information, we need to choose pre-editing to revise source texts using a controlled language. This method will help create comprehensible automated translations for the reading public to access information immediately on the web.

Literary texts have been perceived as a taboo for MT application because they often use metaphorical and idiomatic expressions that have symbolic meanings and cultural connotations. Faced with such a challenge, the author thinks that if a literary source text is edited using a controlled language (CL), MT quality can be improved. Thus, the author proposes pre-editing Taiwan divination verses and posting them along with original verses on the website. The web audiences can choose the edited verses and submit them to online MT system for automated translation in their native languages. It is hoped that pre-edited verses can improve the lexical, grammatical and syntactic accuracy of their English MT outputs and international audiences can understand the messages of the machine-produced verses translations.

Those who love poems and respect the poet's creative style might argue against this proposal. They might claim that editing would ruin the original verses. At this point, the author needs to clarify that editing through adaptation does not want to take away the original textual and linguistic features of Chinese divination verses. Rather, the original version written in archaic Chinese words is still uploaded on the website; we just supplement another version that is written in vernacular Chinese through editing with CL strategies. We try to make it convenient for international audiences to understand the messages of the verses using the English MTs produced by online NMT systems, such as Baidu and Google Translate. The edited Chinese divination verses can be viewed as an explanatory, functional version that helps improve the accuracy of their English MT outputs. Notably, edited texts still retain the original thematic meanings; they only change the surface linguistic structures and expressions. Functionally, they are used to boost MT-mediated web-based communication.

The author believes that divination verses, which are one significant feature of local culture, are worth an introduction to international audiences through machine-mediated translations on the web. To help audiences get more accurate English MT outputs, the divination verses must be pre-edited. Since the translation industry has used CL to edit source texts to produce intelligible multilingual MTs, we can replicate this operation. But what CL strategies do we need to use when editing divination verses? How do these strategies work for MT? What practical implications does MT-mediated communication through verse editing with CL strategies suggest? These questions can be answered through an investigation in this paper.

2. Controlled language

To date, use of controlled language has been discussed in MT studies. Pre-editing means revising a source text before it is translated by the MT system. Cardey, Greenfield & Wu (2004) have claimed that "since the 1960s, controlled language has been applied to NLP [Natural Language Processing] research" and many studies have shown that "the characteristics of controlled language can reduce the complexity of natural language if it is well designed and correctly employed" (p. 38). In modern times, a couple of papers (Roturier, 2004; Bennett & Gerber, 2003; Nyberg et al., 2003; O'Brien, 2010) confirm the effectiveness of using controlled language (CL) for MT

application. The source text written in a controlled language shows lexical, syntactic or semantic restrictions, so its semantic clarity is enhanced and helps reduce MT errors (Kamprath et al., 1998). The CL restrictions are used to reduce structural complexity and semantic ambiguity. Simplicity and explicitness become the overriding linguistic features of a CL.

Many organizations have developed controlled language systems[1] and have set machine translatability guidelines, including AECMA Simplified English (SE), Attempto Controlled English and others (Bernth & Gdaniec, 2001; O'Brien, 2003; Roturier. 2004). However, these CL rules are designed for English documentation, not for Chinese documentation. Some CL rules (Shih, 2006) are proposed to revise technical texts. Domain-specific texts are easily controlled in vocabulary and grammar, but literary texts are more challenging. Over the past few years, due to a great improvement in modern NMT systems,[2] the author wonders what CL strategies can be applied to revise literary texts such as divination verses and how far their MT outputs can improve their semantic and grammatical accuracy. Thus, the author investigates the English MTs of pre-edited divination verses and tries to identify some CL strategies.

3. Methodology

This section introduces collected data and research methods.

3.1 Taiwan Divination Verses

To conduct an investigation of CL strategies that can be applied to improve MT quality, *Great Emperor Baosheng's Sixty Divination Verses* (Qianshi Net, n.d.) and *Saint Emperor Guan's One Hundred Divination Verses*[4] (WinTimes n.d.) are collected. These verses are pre-edited and their MT accuracy is checked. After this assessment, most often used CL strategies are identified and proposed.

Taiwan divination verses, written in archaic Chinese, consist of four five-or-seven-syllabus sentences with no regular rhythmic patterns. They are initially created by anonymous literary men. They address a wide range of subjects, including career, business, wealth, health, traveling, marriage, giving birth and others. After immigrants introduced them into Taiwan, local Taiwanese started using them as God's guidance.[3] These verses have played an important role in Taiwanese daily life. Many Taiwanese interpret the thematic meaning of a drawn verse to predict their destiny and good luck. The online verses are available on Taiwan's official and private websites.

3.2 Methods

After investigating the MT outputs of edited verses, the author identified some effective CL strategies. The procedures of editing consist of two major parts. On the one hand, all archaic and single-syllable words are revised into vernacular Chinese words, and grammatical features are also adapted.

All difficult archaic and single-syllable words that cannot be rendered accurately by the NMT system need to be revised. Meanwhile, the elliptical structure—a typical feature of archaic Chinese sentences—needs to be paraphrased to restore missing components, such as the subject and the object of a sentence. A conjunction is often added to clarify the logical relationship between two clauses within a sentence.

On the other hand, idiomatic expressions and Chengyus (fixed four-character phrases with specific allusions) used in the verse lines need to be paraphrased and notes are added. The special connotations and implicit meanings of cultural references can be made explicit by adding notes. Additionally, proper nouns that are used in verse titles need to use notes to provide background information.

Rhythmic properties and sound effect of verses are not preserved when the verses are edited. The controlled verses aim to make their MTs rendered clearly, not for audiences to appreciate literary beauty. After all collected verses are edited following the above procedures, they are submitted to online Google Translate to test their semantic and grammatical accuracy. Figure 1 shows the procedures of editing Taiwan divination verses.
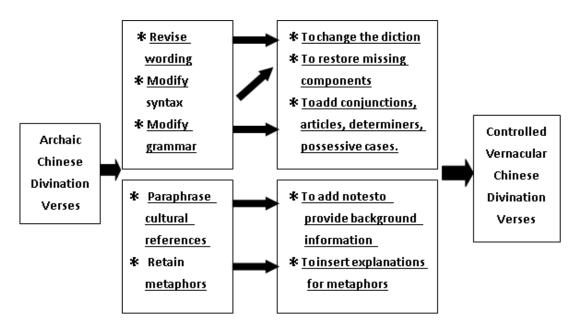

Figure 1. *The procedures of editing divination verses*

The author and her colleague together evaluate the MT accuracy. They discuss and reach a consensus about some effective CL strategies that are often used to improve the semantic, grammar and syntax accuracy of English MT outputs. The basic requirements for a good MT output are semantic, grammatical and syntactic accuracy. The prerequisite is clear comprehension without the need to make a cross-reference between MT and the source text.

4. Findings and Discussion

This section reports some effective CL strategies, justify how they work and discuss the practical significance of editing divination verses using CL strategies.

4.1 CL strategies applied to revise the verses

Several Chinese CL strategies are proposed in this paper. They are used to improve the accuracy of English MT outputs in the aspects of vocabulary, grammar and syntax. Table 1 provides a list of CL strategies and their purposes.

Table 1 CL strategies and their purposes

CL strategies		Purposes
Vocabulary	Use of vernacular, two-syllabic or multi-syllabic Chinese words, not archaic, single-syllabic Chinese words	Semantic simplicity and clarity
	Use of plain, common words	Reduction of semantic ambiguity
	Paraphrasing of cultural references	Elimination of exotic linguistic features
	Addition of notes for background information	Explication of symbolic meanings of metaphors
	Insertion of explanations for metaphors	
Grammar	Use of articles (eg., *a* and *an*)	Enhancement of grammatical accuracy
	Use of possessive case (eg., *your*)	
Syntax	Use of a conjunction to connect two clauses	Enhancement of logical relationship between clauses
	Restoration of missing components (eg., subjects or objects)	Reduction of structural incompleteness

To improve the semantic and grammatical accuracy of MT outputs, the basic strategies are the use of clear-meaning, common words and the use of simple sentence structures. Indeed, the above CL strategies are not exhaustive because new ones could be added, and old ones might be unnecessary as the NMT system evolves over time. Whatever the CL strategies may be, they have a similar purpose of fostering MT translatability by using restricted diction, grammar and syntax.

4.2 How the CL text works for MT

To justify how CL strategies work for MT, the English MT outputs of divination verses before and after editing are compared. Examples are provided as follows.

4.2.1 Vocabulary

Replacement of archaic, single-syllable words with vernacular, two-syllabic or multi-syllable words is an important strategy. Archaic Chinese often uses single-syllable words, but vernacular Chinese uses multi-syllable words. The corpus of Google Translate has stored vernacular Chinese texts, not archaic Chinese texts, so the use of single-syllable words has the higher possibility of producing MT errors.

The following examples show how the English MT outputs of Taiwan divination verses have greatly improved their semantic accuracy before and after they are edited using some lexical CL strategies. From hereafter, ST1 means an unedited source sentence, and ST2, the edited source sentence. MT1 is the English translation of the unedited sentence produced by Google Translate; MT2 is the English translation of the edited sentence produced by Google Translate.

Example 1 (No.49 of *Great Emperor Baosheng's Sixty Divination Verses*)
ST1: 清江鼓楫月盈船。 [Lit: Clear river, drumming peddle, moonlight over boat.]
ST2: 你划一艘船且明月照著船。 [Lit: You row a boat and the moon lightens up the boat.]
MT1: Qingjiang Gushu Yueying Ship.
MT2: You row a boat and the moon shines on the boat.

This example shows that single-syllable words, 月 (yue) and 盈 (ying), represent one noun (the moon) and one verb (light up), but Google Translate cannot accurately decode their parts of speech and combine them into one English word, "yue-ying". In contrast, after we change them into two-syllabic words, 明月 (mingyue/bright moon) and 照亮 (zhaoliang/illuminate), their English MT outputs are semantically correct as "the moon" and "shine".

Not only do we need to edit archaic words, we also need to paraphrase all cultural references to increase the comprehensibility of their MT outputs. Examples 2 & 3 show how the English MT outputs have improved their semantic accuracy after we paraphrase cultural references.

Example 2 (No.79 of *Great Emperor Baosheng's Sixty Divination Verses*)
ST1: 乾亥來龍仔細看。 [Lit: Cian Hai, comes the dragon, closely watch.]
ST2: 當你仔細看西北方，你將看見一龍前來。
    [Lit: When you closely look at the North-West, you will see a dragon coming forth.]
MT1: Dry Hai to Long closer look.
MT2: When you look closely to the northwest, you will see a dragon coming.

Example 3 (No. 25 of *Saint Emperor Guan's One Hundred Divination Verses*)
ST1: 亥子丑月漸亨嘉。 [Lit: Hai Zih Chou months, gradually good and perfect.]
ST2: 在十月、十一月及十二月，你的運氣會逐漸轉好。
    [Lit: In October, November and December, you start to own good luck.]
MT1: On becoming Heng Jia Hai Zi Chou.
MT2: In October, November and December, your luck will gradually improve.

As shown above, before editing, the English MTs of cultural references, Cian Hai [乾亥] and Hai Zih Chou [亥子丑], cannot produce correct English MTs. In contrast, after editing, their English MT outputs, "the North-West"and"October, November and December," are semantically correct.

Furthermore, regarding proper nouns, such as names of people and specialized subejcts, notes can be added to provide background information. International audiences do not have sufficient knowledge of Chinese cultural references. Adding notes helps the audiences use the new acquired information from notes to increase their cultural assumptions in their cognitive schema. Thus they can retrieve the new-acquired information to help understand the meanings of cultural references in the MT outputs. Examples 4 and 5 are cases of using the strategy of supplementing extra information.

Example 4 (No. 2 of *Saint Emperor Guan's One Hundred Divination Verses*)
ST1: 張子房遊赤松。 [Lit: Zhang Zifang travelled to Chisong.]
ST 2: 張良*旅行到白雲山。 [Lit: Zhang Liang traveled to Baiyun Mountain.]
註: 張良刺殺秦始皇失敗了，所以他躲藏在小城。他在一座橋上遇見了一位老人。這位老人要求他去
    撿起他的鞋子。他乖乖地服從了命令。最後這位老人送給他一本關於兵法的書。一些年後，他成
    功地幫助劉邦建立漢朝。完成他的使命之後，他辭掉官職。他前往白雲山過著隱居的生活。
[Note: Zhang Liang did not kill Emperor of Qin Dynasty successfully. He hid in a small town. He met an old man
    on a bridge. This old man asked him to pick up his hoses and he obeyed the order submissively. Finally the
    old man sent him a book on the art of war. Several years later, he successfully helped Liu Bang establish the
    Han Dynasty. After accomplishing his mission, he resigned from his positon and travelled to Baiyun
    Mountain where he lived a secluded life.]
MT1: Zhang Zifang You Chisong
MT2: Zhang Liang* traveled to Baiyun Mountain
Note: Zhang Liang failed to assassinate Qin Shihuang, so he hid in the small town. He met an old man on a
    bridge. The old man asked him to pick up his shoes. He obediently obeyed the order. Finally the old man
    gave him a book on the art of war. Some years later, he successfully helped Liu Bang establish the Han
    Dynasty. After completing his mission, he resigned from office. He went to Baiyun Mountain to live in
    seclusion.

Without adding a note to provide background information, Western audiences cannot have a clear understanding of why Zhang Liang traveled to Baiyun Mountain and neither can they learn the noble character of Zhang Laing. Additionally, Zhang Zifang is revised as Zhang Liang because the latter is a more familiar name to contemporary Chinese although the two names refer to the same person.

Example 5 (No. 7 of *Saint Emperor Guan's One Hundred Divination Verses*)
ST1: 指日丹成謝巖谷。
    [Lit: In the future you finish learning the immortality skill and leave the rocky valley.]
ST2: 將來你結束學習長生不老技術*之後，你將離開山谷。
[Lit: In the future, after you finish learning the immortality technique, you will leave the valley.]
註：長生不老技術教授人們如何製作長生不老藥丸及如何變成仙人。
[Note: Immortality technique teaches people how to make immortality pills and how to become immortals.]
MT1: Xieyan Valley is just around the corner.

MT2: In the future, after you finish learning <u>the technique of immortality</u>*, you will leave the valley.

Note: Immortality technology teaches people how to make pills for immortality and how to become immortals.

Before adding the note of the immortality technique, Western audiences might not understand clearly how the unique medical technology was practiced in ancient Chinese history. The added note helps Western audiences understand the content of the technique.

Meanwhile, some metaphors in divination verses cause a cultural barrier. To help Western audiences understand the symbolic meanings of metaphors, we can insert explanations. Example 6 shows this case.

Example 6 (No. 15 of *Great Emperor Baosheng's Sixty Divination Verses*)

ST1: 一輪<u>明月</u>照千家。[Lit: One moon shins over thousands of families.]

　　　纖纖<u>雲翳</u>謾護相遮。[Lit: Thin clouds spread to cover.]

ST2: <u>明月 （好運） </u>照亮著許多家庭。

　　　[Lit: The bright moon (good luck) shines many families.]

　　　<u>浮雲 （挫折） </u>偶而也遮住月亮。

　　　[Lit: Floating clouds (frustration) occasionally cover the moon.]

MT1: A bright moon illuminates a thousand families.

　　　 Slender cloud cover.

MT2: Bright moon (good luck) illuminates many families.

　　　 Floating clouds (frustration) occasionally cover the moon.

Audiences from different cultures approach the same word using different background information and thus have different interpretations. To avoid misunderstanding, we may add some explanations to suggest the fixed symbolic implications of the metaphors in the source culture. Thus, Western audiences can understand metaphorical meanings easily and clearly.

To summarize, we use the paraphrasing strategy to explicate the implicit meaning, add notes to provide background information and insert explanations to present the symbolic meanings of metaphors. All these CL strategies have justified their effectiveness of improving MT semantic accuracy and boosting MT-meditated web-based communication.

4.2.2 Grammar

Although the NMT system has greatly improved grammatical accuracy of its output these years, it occasionally produces errors as the source sentence does not use an article or/and a possessive case. Thus, we suggest that articles and possessive cases are used in the pre-edited text. Examples 7 and 8 show these cases.

Example 7 (No. 18 of *Great Emperor Baosheng's Sixty Divination Verses*)

ST1: 匆匆匹馬掛金鞍。[Lit: Rush to have the horse hang up golden saddle.]

ST2-1: 你匆忙在馬上掛了金色的馬鞍。 [Lit: Your hurry to hang up a golden saddle on the horse.]

ST2-2: 你匆忙在一匹馬上掛了一個金色的馬鞍。 [Lit: You hurry to hang up a golden saddle on a horse.]

MT1: Hurry up and hang the golden saddle.

MT2-1: You hung up the golden saddle on the horse in a hurry.

MT2-2: You hung up a golden saddle on a horse in a hurry.

We provide two edited sentences with one using an article and the other without using it. In the MT2-1 of the edited sentence without an article, "the horse" refers to the earlier-mentioned horse, but here the horse is mentioned for the first time in the verse line. Thus, MT2-2 is more accurate as it uses "a horse". The MT2-1 and MT2-2 comparison shows that it is better to add an article in the pre-edited sentence, so its English MT output can convey more accurate meaning.

Example 8 (No. 11 of *Great Emperor Baosheng's Sixty Divination Verses*)

ST1: 惹得家堂有是冤。 [Lit: Bother the family to have the enemy.]

ST2-1: 家庭將會容易發生紛爭。 [Lit: Family will easily have disputes.]

ST2-2: 你的家庭將會容易發生紛爭。 [Lit: Your family will easily have disputes.]

MT1: Provoke the family

MT2-1: The family will be prone to disputes.

MT2-2: Your family will be prone to disputes.

In example 8, if we do not use a possessive case before the noun "family", the MT output will be "the family" that refers to the early-mentioned family. However, the sentence suggests "your family", not "the family", so a possessive case needs to be added in the pre-edited sentence. To sum up, some grammatical CL strategies need to be applied to make the English MT output grammatically accurate.

4.2.3 Syntax

With regard to syntax, Chinese divination verses do not use a conjunction to connect two clauses within one verse line. Additionally, some Chinese verse lines do not use a subject or an object, and they are accepted by Chinese audiences. However, without using the functional words, the grammar of the English MT output will be incorrect. Thus, we need to add conjunctions and restore the missing subjects or objects. Some examples are used to justify how English MTs have greatly improved their syntax accuracy after some CL strategies are used.

Example 9 (No. 2 of *Great Emperor Baosheng's Sixty Divination Verses*)

ST1: 何愁萬里熾炎威。 [Lit: You do not need to worry the long-distance sun heat.]

ST2: 你不需擔憂旅途上炎熱太陽。 [Lit: You do not need to worry about the journey's hot sun.]

MT1: He Chou Wanli Blazing Power.

MT2: You don't need to worry about the hot sun on the journey.

This example shows that the archaic Chinese sentence lacks a subject, so its English MT1 is inaccurate. After we add the subject 你 (ni), the edited sentence structure is more complete and its English MT2 is syntactically correct.

Example 10 (No. 50 of *Great Emperor Baosheng's Sixty Divination Verses*)
ST1:貴人不久提攜去。 [Lit: Your patron will promote_very soon.]
ST2:不久後可幫助你的人會來幫忙你。 [Lit: Very soon the one who can help you would come to help you.]
MT1: The nobleman will soon lead.
MT2: Someone who can help you will come to help you soon.

As shown in MT1, the sentence lacks an object after the verb "lead." In contrast, after we edit the sentence by adding an object, English MT2 becomes syntactically correct.   Additionally, many archaic Chinese sentences do not use a conjunction to explicate the relationship between two clauses. When literally rendered, this linguistic structure causes its English MT output to be grammatically incorrect. Thus, we suggest that a conjunction be added in the pre-edited sentence. See one example below.

Example 11 (No. 54 of *Great Emperor Baosheng's Sixty Divination Verses*)
ST1: 潮來水泛魚難覓。 [Lit: Tide comes, water rises and fish difficult find.]
ST2: 潮汐使江水上漲，所以很困難釣到魚。
    [Lit: When the tide comes, the river rises, so very hard to catch fish.]
MT1: Fish are hard to find in the tide.
MT2: The tide makes the river rise, so it is difficult to catch fish.

In this example, English MT1 fails to explicate why the tide causes fish to be difficult to catch as the source sentence is not pre-edited. However, after a conjunction 所以(suoyi) is added, English MT2 can clearly present the cause-effect relationship and communicates an accurate message. The single-syllable words 水 (shui) and 泛 (fan) also need to be edited into two-syllabic words 江水 (jiangshui) and 上漲 (shangzhang).

Overall, the English MTs can be understood easily and clearly after their source texts are pre-edited using the strategies of restoring the missing subject, object and adding a conjunction. This means that the more complete the source sentence structure is, the more accurate English MT output will be produced. Pre-editing using CL strategies aims to help the source text present a more complete sentence structure and produce a more accurate English MT output.

4.3 Practical significance

Editing divination verses using CL strategies take on some practical significance. They increase MT's semantic and grammatical accuracy and boost MT-mediated web-based communication. Furthermore, they create an economic advantage.

Most importantly, CL strategies compensate for the informative inadequacy of cultural references and metaphorical expressions by adding notes and inserting explanations in verse lines. These practical significance can be discussed as follows.

4.3.1 Effective MT-mediated web-based communication.

As illustrated in the previous section, the English MTs of archaic, single-syllabic words are semantically incorrect and the English MTs of the sentences that do not have a subject or an object are grammatically inaccurate. However, after editing, vernacular, multi-syllabic word make their English MTs more semantically accurate. Meanwhile, all cultural references are paraphrased to remove their special linguistic features. The special metaphors are also given explanations to present their symbolic meanings.

In the aspect of grammar, articles such as "a" or "an" and possessive case such as "your" are added, so their English MT grammar turns out to be correct. In the aspect of syntax, a Chinese sentence can make sense without using a subject or an object, but an English sentence will be incorrect without using them. Thus, editing verses requires restoring missing subjects or objects.

Furthermore, to have the inter-sentential relationship made logical, conjunctions can be added and the most often used conjunctions are "and," "if" and "when." After all the above CL strategies are used, the goal of effective web-based communication can be achieved through the production of semantically and grammatically accurate MT outputs.

4.3.2 Economic benefit

Editing verses helps reduce the cost and turnaround time of multilingual translations produced by online NMT systems. The audiences just need to submit an edited text to the online NMT system and choose their native languages as the target languages. After that, they can immediately get the translations in their target languages and understand the content of the MT outputs. Some good-quality NMT systems, such as Baidu and Google Translate, can be freely used without any payment. The accurate MT outputs of edited divination verses can be accessed by all web audiences for free. Thus, pre-editing using CL strategies helps audiences get free and correct MT outputs, showing the economic advantage of cost reduction.

4.3.3 Culture acquisition and comprehension

International web audiences do not know Chinese culture, so Chinese cultural references and metaphors create a communication challenge to them. To help resolve this problem, we need to paraphrase cultural references, add notes and insert explanations. Not only can the edited verses provide clear cultural information, but can create more accurate English MTs. For examples, 白衣宰相 (Baiyi Zaixiang) and 黃閣 (*Huangge)* are paraphrased as 便衣宰相 (Bianyi Zaixiang) and 丞相辦公室 (*A prime minister office*r).

All metaphors, such as 真金 (zhenjin/true gold), 蓮花 (lianhua/the lotus), 喜鵲 (xique/the magpie) and 羽毛 (yumao/the feather), are presented with literal translations plus inserted explanations, such as "true gold (one's talent)", "lotus flower (purity)", "Magpie (good luck)" and "feather (one's reputation)". After implicit meanings of cultural references and metaphors are explicated, the target audience's background knowledge increase and can understand the MT outputs more easily. They can also learn Chinese culture.

The strategies of adding notes and inserting explanations help achieve the function of compensation through information supplementation. Compensation is a "technique which involves making up for the loss of a source text effect by recreating a similar effect in the target text through means that are specific to the target language and/or text" (Harvey, 1998, 37).[5] This compensatory function is similar to A.E. Gutt's (1998) relevance theory that claims that a text may use "the additional means" of added notes to "widen the contextual knowledge of the target audience" (52).[6] The CL strategies of adding notes and inserting explanations help compensate original informational inadequacy and overcome the cultural barrier. The audiences do not need to consult additional information to understand the special meanings of cultural references. Thus, editing verses with CL strategies helps international audiences understand MT outputs and acquire Chinese cultural knowledge.

5. Conclusion

This research proposes some CL strategies applied to edit divination verses to enhance their MT accuracy and comprehensibility. First, difficult classical diction and single-syllable words are edited into vernacular, two-syllabic and multi-syllable words. Next, all metaphorical expressions and cultural references are paraphrased into common expressions and general referents. Notes and explanations are added to supplement cultural information and explicate symbolic meanings. Grammatically, functional words are used to ensure grammar accuracy of MTs. In the aspect of syntax, missing linguistic components are restored and conjunctions are added to make the sentence logically clear and syntactically correct.

One might think that the use of CL strategies will destroy the literary beauty and the vitality of literary works. In the author's view, editing divination verses with CL strategies is functional and transitional. Divination verses through editing can be translated by the NMY system into correct, comprehensible English MT outputs, so more people can read and understand them. Just as one must die to have a new life, and death leads to rebirth, the original textual form and linguistic norms of divination verses can be revised, so more people can understand their English MTs easily and clearly. When the correct multilingual MTs of edited divination verses are produced and reproduced across borders and different cultures, the value of divination verses can be increased. Thus, editing verses at sacrifice of their original linguistic norms pay off when their function of MT-mediated web-based communication has achieved.

Endnotes

1. Some CL checkers are developed and employed by organizations, including Avaya's Controlled English (ACE), Boeing's Simplified Technical English (STE), Caterpillar's Capterpillar Technical English (CTE), Ericsson's Ericsson English, General Motors' Controlled Automotive Service, IBM's Easy English, Kodak's International Service Language, Nortel's Nortel Standard English, Sun Microsystems' Sun Controlled English, Xerox's Xerox Multilingual Customized English and others (Muegge, 2008). However, the design of these CL systems is for the English source text, and particularly for technical documents, so they are not suitable for editing Chinese source texts, especially for divination verses.

2. In the early period of MT development, rule-based MT systems (RBMT) are used. The system builds its translation model through a parallel corpus and uses the statistical technique to measure the highest probabilities for target language (TL) strings or phrases (Stix, 2006; Koehn, 2010). Later, statistical MT system (SMT) is developed. It finds the matched segments of the highest probability from the corpus that saves millions of bilingual documents, and then combines the extracted target-language segments into a translation sentence (Cheng, 2008).

3. In Taiwan temples, bamboo lotteries are placed in a bucket. Believers often draw a lottery after revealing their problems and sending requests to God. Then they cast two wooden moon blocks. When the blocks fall with one facing up and the other facing down three times in a row, the lottery is believed to be the correct one and the corresponding divination verse is interpreted. The temple overseer aids the interpretation because the poem is characterized by classical Chinese diction, cultural references, and allusive titles and is therefore not easily understood by the general population. Nadeau's (1987) survey indicates that believers visit temples to seek divination verses when they have health problems, family trouble, bad luck, difficult career choices, and more.

4. According to Liou Yu-long, *Saint Emperor Guan's One Hundred Divination Verses* are one of most-often used verses in Taiwan (qtd. in Lin, 2008).

5. Nida & Taber (1969) argue that "what one must give up to communicate effectively can be compensated for, at least in part, by the introduction of fitting idioms" (p.106). In addition, Wilss (1982) recommends "a lexical by-pass strategy such as paraphrasing or explanatory translation" as "the only compensatory way out open to the translator" (p.104). Compensation has been discussed by Hervey & Higgins (1992) based on its classification and methods, such as "compensation in kind, compensation in place, compensation by merging and compensation by splitting" (pp. 34-40). Compensation is also used as a device to settle translational clashes between conquest (target-dominant) and colony (source-oriented), and between absorption (domesticating) and resistance (foreignizing). In this research, the focus is put on compensation through added notes and inserted explanations. The purpose is to expand the audience's contextual knowledge for easy comprehension of implicit cultural connotations.

6. Gutt (1998) points out that "the publisher of literary writings usually intervenes and provides various explanatory notes to the original text to help the reader overcome the reading problems due to the lack of the historical and cultural background of a particular piece or literature" (p. 50). If the modern context within which the reader is located leads to a wrong understanding, the publisher usually uses the method of added notes to improve the contextual relevance since they cannot adapt the original text.

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