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**MS980 BUSINESS ANALYTICS**

**GROUP ASSIGNMENT**

Using DeepL to Translate Tang Dynasty Poems from Chinese to English

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The Tang dynasty is a radiant period in Chinese history, known for its governmental, cultural achievements, and an enormous body of literary work. The era produced an abundance of creative talents, including Li Bai, Li Shangyin, and Du Fu. Translating these works from master poets of the past provides access to China's rich history, philosophies, and culture. But this presents a difficulty. Good translations are exceptionally hard to create, requiring a rare combination of abilities: fluency in ancient Chinese and English, a thorough understanding of the poem's cultural context, and a talent for poetic creativity. AI translation provides the opportunity to convert Chinese poetry quickly into English, bypassing the strict requirements for a talented human translator, while being more scalable and cost-effective than using a human. But using AI translation software for poetry also comes with issues. It fails to engage in the poetry as a human would, and so does not identify and recreate the intricate nuances, emotions, and cultural subtleties present in the original works.

For this essay, we tested how DeepL (a free and popular translation tool) performs in translating three popular Tang dynasty poems. As these poems have already been translated by hobbyists, experts and members of our team, this essay follows with our findings when comparing and assessing DeepL’s performance. From testing the AI, we can also gain some insight into how to appropriately use DeepL.

To start with, DeepL generally outputs a good literal meaning for each poem, and this is its greatest strength. It also uses context clues to find better translations where it was necessary. For example, in the second line of ‘Going up to the Pleasure Garden’ by Li Shangyin, although the characters “意不適” (yi bu shi), literally translates to ‘not feeling well’, DeepL might have inferred from the surrounding context (the subject was travelling) that the subject was not physically unwell but rather in a bad mood. Chinese characters often have many possible meanings, so it is necessary to identify the correct meaning of a character by its surrounding context. Picking up on this context is crucial for translating Chinese text. In the final line, an incomplete phrase was written with only one character in a normally two-character compound. The single character “近” (jin) was correctly translated as ‘close to’ which would usually take two characters “接近” (jie jin). DeepL translated this without issue, translating the final line to ‘But it’s almost dusk’.

However, there were some mistranslations in DeepL’s output. In the third line, “無限” (wu xian) is employed as a device to accentuate the extreme beauty and splendour of the sunset. “無限” acts as a modifier for the adjective, ‘beautiful’. DeepL couldn't recognise “無限” as a rhetorical device, translating it literally as ‘infinity’. Thus, the translation from the AI was that the ‘sun has no limit’ instead of the preferable translation, ‘the sunset is indescribably beautiful’. Such inaccuracies hint at DeepL not being a complete solution to solving the problem of translating Tang dynasty poetry. Without validation by a human reviewer, DeepL may misinterpret the intent of the poet’s language embedded within the poem, leading to inaccuracies in the translated text.

Using AI for translation saves us a lot of time and effort. If most of the translated content is accurate enough, considering the lack of resources going into it, the errors may be tolerable but later corrected by a human reviewer. We should keep in mind that the amount of poetry to be translated across the Tang dynasty and across Ancient Chinese history is so vast that it would be unfeasible to translate using only humans. On the other hand, DeepL also cannot fully replace the human translator. DeepL does streamline the process of human review by providing alternative translations for individual words and phrases to help improve the reviewer’s productivity. But to maintain the integrity and intentions of the original text, the reviewer still needs to be highly proficient in both languages.

While AI has a the potential for inaccuracy, human translation also is not without inaccuracy. A human translator can improve their own translation using DeepL as a tool to provide ideas and to verify their own work.

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Figure 1: Climbing to Leyouyuan, by Li Shangyin

For a successful translation, DeepL should produce natural and fluent text. Poetry presents a greater challenge in this aspect compared to other types of text inputs. In some initial tests with DeepL, we found that translations of academic articles and instruction manuals (also from Chinese to English) were relatively straightforward for the AI, and it was able to achieve a high degree of fidelity. These forms of text adhere to consistent speaking voices and conventions. However, poetry does not necessarily conform to such consistency. Even basic rules of language or grammar may be intentionally broken for style, rhythm, or flow. When DeepL translated our three poems, we observed a tendency towards being reductive; it overly simplified the complexity of the original works. We previously noted an instance where the AI completed incomplete phrasing, which did improve the accuracy of the output. But in doing this, DeepL reduced the language down to a very basic level of English in its translation.

Although the same set of literary devices for Chinese poetry do not exist in English, human translators can use their discretion in inserting new poetic devices to capture the intended flair of the original work. Furthermore, where there is a shared device (such as a rhyme), DeepL does not attempt to replicate this as it does not ‘know’ to identify the inputted text as poetry, which can be demonstrated by comparing the AI’s translation of 'Going up to the Pleasure Garden’ to that of the human translation (figure 2). From just the obvious changes, such as rhymes being reintroduced and phrases being broken up to encourage a rhythm, we found that the tone and effect on the reader of the original work is better portrayed from the latter translation. Not only does it improve on conveying some of the same style of the original, but it also improves the readability and better suits the palette of English language readers.

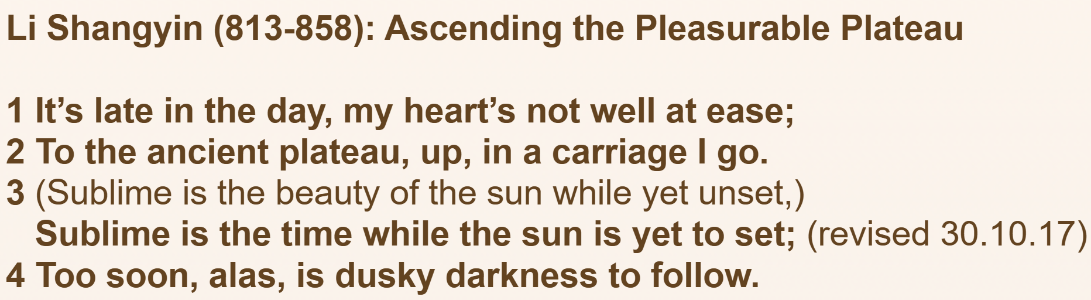


Figure 2: Human translation of Li Shangyin’s ‘Going up the Pleasure Garden’

The AI’s tendency to be reductive could still be useful in providing a relatively clean output of the literal meaning of the original text. In the case of interpretation-rich poetry, the AI’s clean translation might be useful to aid a human translator who would otherwise tend towards conveying their own interpretations while missing others that might be just as valid. In the same human translation above, the writer chose to emphasise the beauty of the unset sun as opposed to the beauty of the setting sun. Both might be valid interpretations of the original text, but both convey a subtly different meaning. The former might be a metaphor that life is beautiful, whereas the latter might mean that the ending of joyous things makes them more beautiful. We feel that the contrast between the limitlessness of the beauty and the closure of sunset would be the intention but of course there is no way to know for sure. For a human translator, having the ability to compare their translations with AI might allow them to improve the fidelity of their own translations.

Another aspect of the fluency of poetry is its lyricality. Although DeepL provides simple translations, it does not attempt to imitate any of the sound or rhythm related aspects of the original. When writing the poetry, the decision of what word to use would be made with poetic sensitivity in mind. In making the translation, even if the AI were to attempt to make a rhyme, the AI is more constrained than the original poet in attempting to replicate the intended sonic qualities of the original work. However, a human translator can use their discretion to stretch the literal meaning of the translation to accommodate new poetic devices to reintroduce the intended sound of the original. So, when translating poetry using AI, a reviewer with skills for poetry would still need to adapt the poem to re-introduce the original appeal.

Moreover, the different grammar conventions of Chinese and English pose a significant challenge for AI translation systems such as DeepL. The omission of subjects and the absence of verb conjugations in Chinese means that translators must rely on contextual hints to reach an accurate translation. The elimination of the subject, a regular appearance in Chinese writing, occurs in all three of the translated Tang dynasty poems. While the omission of the subject (such as not using ‘I’) and passive expression are used to convey a sense of universality and timelessness in the poems, DeepL struggles to keep this aspect of the poem and tends to incorrectly attach floating descriptions and actions to other objects in the sentence. In Meng Haoran's poem “Spring Dawn”, the first line of the poem was translated by DeepL as "Spring sleeps without feeling the dawn" which indicates ‘spring' as the acting subject. However, the original meaning of the word “春眠” (chun mian) in this context is describing a person's deep sleep in spring. The characteristic of subject omission in Chinese poetry made AI translation tools like DeepL unable to identify the intended meaning.

Additionally, due to an absence of verb conjugations, the timing of the events described are also found through context. Unlike English, where verb endings change to indicate time and other nuances (e.g., “walk” vs. “walked”), Chinese uses context. For example, throughout the poem “Spring Dawn”, Meng Haoran employs descriptive language and natural imagery to evoke a sense of time and progression without using grammatical time markers. The third line was translated by DeepL as “the wind and rain come at night”, while it should be translated as “the wind and rain came last night”. Without clear verb conjugations to indicate the timing of the action, DeepL erroneously assigned a present-tense interpretation, overlooking the past tense implied by the context of the poem. As a result, the translated text may misrepresent the temporal sequence of events, underscoring the limitations of AI translation in accurately defining context in Chinese poems.

DeepL often overlooks the historical context and linguistic nuances present in older texts, opting instead for modernised language that aligns with contemporary sensibilities. DeepL is not accurate in dealing with old-fashioned or literary texts, shown through our testing using ancient Chinese poetry. Although DeepL converting antiquated Chinese into modern English might make the text easier to understand, this comes with losses in the original flavour and literary appeal. A dramatic example of this would be in Li Shangyin's poem "Going up to the Pleasure Garden", where DeepL translated the second line as "Driving to the Ancient Plains" and lost the literal meaning of the original text. The original Chinese word, possibly translated as “riding”, described travelling by horse as opposed to driving in a car. The AI's tendency to translate archaic texts into modern language may stem from a limited frame of reference, grounded in contemporary language. Consequently, while DeepL may simplify older texts for modern understanding, the translation fails to capture the original historical context of the Chinese poems.

DeepL also struggles to translate subtexts or secondary meanings, which are ever present in poetry in general. While the imagery of nature such as seasons, flowers, and landscape are common in ancient Chinese poems, they tend to be utilised as a metaphor, implying a different interpretation to the same text. For example, the literal meaning of the poem “Spring Dawn” by Meng Haoran is that the subject woke up in spring from the sound of birds, remembered the storm from the previous night and wondered how many flowers must have fallen from that storm. Although this meaning is adequately translated by the AI, it fails to maintain the underlying meaning that there are light and dark aspects to nature (From Meter to Meaning, 2021). To illustrate, the first two lines of the poem convey the positive side of nature with uplifting phrases like “春曉” (chun xiao), meaning ‘spring’, and “啼鳥” (ti niao), meaning ‘the chirping of birds’. The final two lines are negatively framed with phrases like “夜來” (ye lai), meaning ‘in the night’, and “風雨聲” (feng yu sheng), meaning ‘rain and storm,’ which reflect a darker imagery of nature. This deeper interpretation, however, is not conveyed by DeepL.

Underlying meanings are also demonstrated through the tone of the poems. For example, in Li Bai’s ‘Early Departure from Baidi City’, he described himself happily leaving Baidi city for Jiangling. Throughout the poem, Li Bai adopts an optimistic tone. He describes his carefree attitude through phrases like “輕舟” (qing zhou), meaning ‘light boat’, and his positive outlook through “彩雲” (cai yun), meaning ‘colourful clouds’. Although DeepL accurately translates these phrases, the upbeat tone of the poet gets lost in the translation. This could be largely because AI does not know that it must find and preserve the second meanings of the poems. This links back to the previous observation that AI tends to be reductive. By over-simplifying the poem in its translation, the output does not maintain the same depth of meaning as the original. Poetry is often thought-provoking and interpretation heavy. DeepL’s translation does not constitute good poetry as it removes the ambiguities that spark the imaginations of the reader. This is because DeepL, unlike humans, does not know that the inputted poetry was written with an intended purpose besides as a mere description. It is not in the mind of DeepL to respect the poetic integrity of the input work.

Nevertheless, it can be argued that interpretations of poems are subjective, as it depends on the personality and beliefs of the human translator. Hence, DeepL could be useful in providing translations of different poems that avoid a translators’ biases, which could help the reader understand the core idea of the poem rather than having to read through the interpretations of translators. Although it is not compelling, DeepL’s translation could help a reader investigate the original meaning of the poem. In this way, the AI tool might help human translators realign their vision of the poem towards a more neutral and objective translation. However, it should also be considered that DeepL might inherit cultural biases from its develop training data from which it was developed.

Our exploration into the translation capabilities of DeepL for Tang dynasty poetry reveals both strengths and limitations. DeepL demonstrates proficiency in providing literal translations and utilising contextual clues to enhance accuracy. However, it struggles to capture the poetic nuances, emotional depth, and cultural subtleties inherent in our selected poetry. DeepL’s reductive tendencies often lead to oversimplification and the loss of the original work's lyricality and layered meanings. Moreover, DeepL's inability to know the historical contexts and linguistic nuances poses challenges in translating older texts authentically.

While AI translation can provide a neutral and unbiased rendering of poetry, it lacks the interpretive depth and creative insight of human translators. Therefore, while DeepL can be a valuable tool in aiding translation efforts, particularly for conveying basic meanings and facilitating initial drafts, it should be complemented with human oversight to ensure the fidelity, fluency, and poetic resonance in the final translated work. Ultimately, a harmonious collaboration between AI and human expertise holds the potential to enhance the efficiency and accuracy of translating classical Tang dynasty poetry while preserving its artistic and cultural integrity.

# Appendix

**POEM 1:**

**Human translation**

Going Up to the Pleasure Garden, by Li Shangyin

Toward evening I felt uneasy;

And rode up into the hills.

The sunset was indescribably beautiful;

But night was falling fast.

**AI translation**

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Figure 3: Poem 1: Climbing to Leyouyuan, by Li Shangyin, translated by DeepL

**POEM 2:**

**Human translation**

Setting Off Early from Baidi City, by Li Bai

In the morning one departs from Baidi, amongst rosy clouds;

One thousand li to Jiangling, in one day returning.

On two sides apes call, not stopping;

This little boat has passed ten thousand layered mountains.

**AI translation**

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Figure 4: Poem 2: Early departure for Baidi City, by Li Bai, translated by DeepL

**POEM 3:**

**Human translation**

Spring Dawn, by Meng Haoran

In Spring one sleeps, unaware of dawn;

everywhere one hears chirping birds.

In the night came the sound of wind and rain;

who knows how many flowers fell?

**AI translation**

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Figure 5: Poem 3: Spring Dawn, by Meng Haoran, translated by DeepL

## Poet’s styles:

We have chosen three poets from the Tang Dynasty, representing the early, middle and late Tang Dynasty respectively. Their styles are all different: Li Bai is good at depicting magnificent landscapes and praising wine, poetry, songs, and love. Li Shangyin's poems often express the bitterness and helplessness of life, as well as his feelings about the passage of time and the changes in life. Meng Haoran's poems focus on natural landscapes and are full of appreciation of natural scenery and philosophical thoughts on life, showing his love for nature and his boredom with the worldly life.

## Intro on Poets:

Meng Haoran (689–740) was a poet from the early Tang Dynasty, another representative figure of the Romanticism poetic circle along with Li Bai. Born in Yangzhou, Jiangsu Province, Meng Haoran held some local official positions but later chose to abandon his official career due to his disdain for bureaucratic life, opting for a reclusive life in the mountains and forests. His poetic style is fresh and elegant, rich in poetic sentiment and artistic conception, with themes mainly focusing on landscapes, nature, and rural life, reflecting his love for nature and his weariness of secular life. His works primarily depict natural scenery, brimming with appreciation for nature and reflections on the philosophy of life.

Li Bai (701–762) was one of the most representative romantic poets of the Tang Dynasty in China. Born in the northwest region of China, he grew up in a noble family but later travelled extensively, leading a carefree and wandering life. Li Bai's poetic style is bold and unrestrained, filled with praise for the beauty of nature and fervour for life. His works often depict magnificent landscapes and extol the virtues of wine, poetry, song, and love, reflecting his heroic spirit and unrestrained personality.

Li Shangyin (813–858) was a poet from the late Tang Dynasty, also one of the representative figures of the Tang poetic circle alongside Li Bai. Born in Yangzhou, Jiangsu Province, Li Shangyin experienced family tragedies and lived a life of poverty. His poetic style is elegant and subtle, adept at expressing the bitterness and helplessness of life, as well as the melancholy reflections on the passage of time and the changes in life. His works often revolve around themes of longing, parting, and melancholy, with delicate emotions and subtle language that often evoke profound contemplation.

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