Lost In Translator: Understanding the Limitation of Translator in Real-Life from Cultural Difference via User Study

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ABSTRACT

Nowadays, in a highly connected world, translation services bridge linguistic divides and foster global collaboration. In this paper, we explore real-world experiences of navigating cultural nuances in translation for improved intercultural dialogue and more adept translation services. For the user study, we built a chat application including a dynamic topic generator by Dixit Cards and an automated translation system. This application works as a design probe that translates between native languages, fostering informal and friendly communication. Through experiments with ten participants, we examine whether the translation works as an effective tool for communication with Yan Fu's three translation principles. The findings underscore the real-world problems in using translators related to informal talking style, implicit meaning, and diverse conversational styles, which are often missed by existing translation systems. Also, we suggest a future system that is able to collect translator improprieties automatically, including reviewing and categorizing processes. We believe that this work contributes to future advances in translators that can enhance intercultural competence and promote more effective cross-cultural communication.

1 INTRODUCTION

In our interconnected world, translation services bridge linguistic divides, fostering global collaboration. However, real-life encounters, steeped in cultural nuances, expose the limitations of these seemingly seamless tools. Casual ambiguities blossom into misunderstandings, creating friction across the globe. Users grapple with daily translation misinterpretations, leading to frustration and disconnect [1][2].

Cross-cultural research wrestles with methodological challenges entangled with translation quality and the elusive comparability of results. These pitfalls mask erroneous conclusions, potentially mistaken for truth. The inconsistent translation of informal language and slang further hinders daily communication, demanding cultural sensitivity without sacrificing meaning [6][7][8].

Our research embarks on a user-driven journey to illuminate these constraints. By exploring the lived experiences of navigating cultural nuances in translation, we seek to unlock avenues for improved intercultural dialogue and more adept translation services. We propose a novel chat application that seamlessly translates native languages, eliminating frustrating app switching and fostering culturally sensitive communication.

2 PRELIMINARY STUDY

An FGI study investigated how international students in Korea navigate the world of translation apps. Participants united in their reliance on these tools and highlighted both frustrations and potential for improvement.

Key findings from our FGI study are listed below.

- *Accuracy stumbles*: Participants grappled with ambiguous translations, particularly in informal language, leading to misunderstandings and awkward communication.
- *Lost in translation*: Expressing nuanced intent and cultural subtleties proved challenging, compromising meaningful conversations.
- *Workflow woes*: App switching and translation delays hampered communication flow, creating inefficiency and frustration.

Desired features are listed below.

- *Context-sensitive translation*: Participants craved app adaptability to different situations, from translating pictures to daily speech and formal documents.
- *Nuance amplification*: Accurate conveyance of subtle meanings and cultural context was a top priority, ensuring respect and effective communication.
- *Seamless integration*: Integrating translation within chat applications was desired, eliminating app switching and streamlining communication workflows.

As a conclusion, translator apps hold immense potential but require advancements in accuracy, nuance sensitivity, and seamless integration to truly bridge the language gap and empower meaningful communication.

3 DESIGN PROBE

3.1 Pilot Study

A pilot study using HelloTalk preceded the system's design. Two participants, Korean and Chinese, unfamiliar with each other's languages, engaged in a 20-minute conversation translated by Papago and Baidu. After explaining privacy protocols, researchers facilitated a 30-minute annotation and explanation session for participants to identify and address translation errors. Finally, participants were invited to an interview (10 minutes).

	Participant A	Participant B
Cons	It takes **longer** to send a message and it's hard to think of **topics**...	It is **nervous** that I don't know my intention is well delivered...

Table 1: User feedback

The experimenters observed in user feedback (Table 1) a dissatisfaction that could be addressed by designing a new system to

facilitate quicker, more efficient, and accurate conversations. Consequently, we developed our website for conducting user research based on these findings.

3.2 Website Design

Built upon Node.js and Socket.IO, this web application leverages a client-server architecture for real-time communication, seamlessly integrating translator APIs for multilingual support. Users engage in dynamic, language-specific chat rooms, facilitated by real-time messaging and a dynamically updated interface powered by HTML and JavaScript. Socket.IO events orchestrate interactions, ensuring smooth communication and a robust platform for instantaneous messaging, collaborative language exploration, and personalized user experiences. We have meticulously implemented key functionalities, prioritizing both elegance and expected functionality.

3.3 Features

3.3.1 Topic Generator: Dixit Card. Pilot study findings revealed user challenges in initiating conversations, even among acquaintances (Table 1). To address this, we introduced Dixit cards as a shared visual prompt and discussion catalyst (Figure 1). Open to interpretation, these cards invite participants to share unique perspectives and insights, fostering engagement and conversation[3][5].

Figure 1: Dixit card samples

Our design introduces a shared Dixit card on the web page, sparking conversation before users even begin. Descriptions and playful card swaps set the stage for a vibrant exchange, inviting exploration of diverse topics.

3.3.2 Auto translator. To mitigate the time-consuming act of copying and pasting translated text, we experimented with automatic chat translation. Participants communicated across various language pairs, facilitated by diverse translation APIs: Google Translate (Russian, Italian, Urdu, Hindi), Baidu Translate (Chinese), and Papago (Korean).

3.3.3 Bilingual chat rooms. Bridging language barriers, our platform offers dedicated rooms for diverse language pairs. A global room unites all languages through English, while others cater to specific pairings like IT-KR(Italian-Korean). Users can seamlessly switch between rooms, or even create their own, simply by following the "Language A-Language B" format.

3.3.4 Interface Design. Our final design page is shown in figure 2.

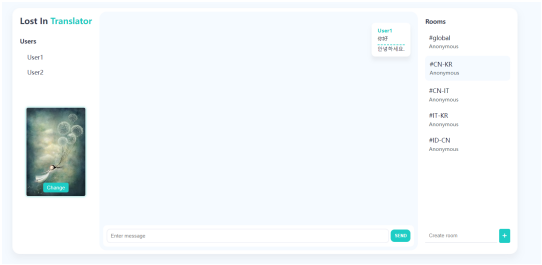

Figure 2: Web Interface

4 PROCEDURE

4.1 Experiment

4.1.1 Recruiting participants. We recruited a total of 10 participants and conducted 5 sets of experiments. The recruitment followed four principles for participants:

- different cultural backgrounds.
- completely unfamiliar with each other's native language.
- friends before the experiment.
- only taking part in one experiment.

The five sets of experiments are set as follows: Chinese-Korean; Chinese-Italian; Chinese-Hindi; Italian-Russian; and Urdu-Hindi.

4.1.2 Conducting the experiment. Each experiment consisted of a 30-minute conversation, a 20-minute explanation, and a 10-minute post-experiment interview.

4.1.3 Post experiment interview. Post-experiment interviews delved deeper into the translator's effectiveness and user experience. We explored participants' feedback on its strengths and improprieties, gaining valuable insights to guide future improvements.

4.2 Analysis

4.2.1 Collecting data. We exported the chat data to Dovetail and invited users to annotate and explain their original meaning to each other, as well as speculate on the reasons for the improprieties. In Dovetail, users can collaborate on editing. Using different colors and content notes can help improve the efficiency of the interpretation process and facilitate subsequent analysis, increasing the credibility and accuracy of the analysis.

Five experiments, ten participants, and a tapestry of languages and APIs - this study delves into the validity of translation data. Through diverse topics and nuanced cultural contexts, it examines whether translation APIs uphold the tenets of Yan Fu's three translation principles.

4.2.2 Analyzing data. To analyze the experimental translation data, we mainly used **thematic analysis** to categorize, describe, and interpret the data[4]. First, we read and analyzed the data repeatedly to identify several major themes after the participants used different notes. Then, we categorized the data under each theme and described and interpreted each category based on the three principles. Finally, we integrated the data to form a complete interpretation.

5 FINDINGS

Through the use of Lost In Translator for experiments and interviews, we aimed to observe how participants perceive translation tools.

Particularly, we intended to observe the following aspects during the experiment:

- Issues arising from the act of translation itself
- Problems encountered during the process of using the translation tool
- Experiences of participants while utilizing the translation tool

We identified a total of six intriguing situations encompassing these aspects during the experiment, and we would like to share them.

5.1 Formality of Talking Style

We have identified an issue with translation systems not adequately reflecting users' diverse conversational styles. Specifically, the translation fails to maintain the formality of each conversation or properly recognize informal expressions. For example, in a conversation between a Chinese participant and an Italian participant, Chinese sentence meaning *"Okay, I recommend you to read this book"* was translated as *"Ok. Vi consiglio di leggere questo libro,"* which turned out to be a very formal expression in Italian than the original Chinese, and it doesn't suit the context.

5.2 Implicit Meaning

During conversations, participants tend to explain various situations or scenarios by using some phrases in our native tongue. However, translators often failed to catch the implicit meaning, especially on idioms or some phrases. For example, in one session that have done between Italian and Russian, the sentence that means *"Let's go, Napoli!"* turns into a weird sentence that means *"Force Napoleon to leave"*. As this example, different idioms or phrases vary from culture-to-culture, translators sometimes loses its original meaning thus changing the whole meaning of the sentence.

5.3 Premature Semantic Translation

We found that translator tends to substitute words with analogous shapes or phonetics when confronted with untranslatable terms. This adaptive strategy, while aiding in syntactic fluidity, inadvertently leads to a failure in capturing the true intention of the conversation. For instance, while in conversation between Chinese and Indian, *"dumpling"* in Chinese was translated into *"fritter"* in Hindi, due to their similarity on shape. This translation not only misinterprets the word but also neglects its cultural significance in the context of the Lunar Year festival.

5.4 Fear of being mistranslated

Interestingly, participants felt more tensions than a normal conversation, regardless to whether the translation was incorrect or not. They worried that the translation tool might not perform accurately. Consequently, participants had a tendency to verify by re-translating the output even when the translation was correct, or hesitated to use the translator due to the fear of potential errors.

One participant shared a thought about their preference for using body language over relying on the translation tool for conversation.

> "So I think, first of all, using the body language can be more efficient. I think using the translator to a non English speaker can be very embarrassing. I think maybe he just don't understand. Yeah."

6 FUTURE WORK

We wanted to understand the issues associated with using a translator in real-world, casual conversations among friends. For our user study, we created a system to function as a design probe and conducted various conversation sessions to collect instances of improprieties. Throughout this process, we realized that our Lost In Translator (LIT) system could evolve into an automatic translator impropriety collector. We have sketched the architecture of the new system in Figure 3. The LIT system is divided into two main components: LIT client and LIT server.

The LIT client serves as a chatting platform where students with different language bases can converse, make international friends, assess translation quality, and learn languages together. Users engage in conversations using their preferred languages while the Translation Module of the LIT client automatically translates each user's messages for the other party. If there are issues with translations, users can label problematic segments; both parties then see these labels and reasons, facilitating language learning through exposure to translation errors.

On the other hand, the LIT server automatically collects and categorizes these translator improprieties. Improprieties labeled by users on the LIT client are collected and sent for review to a pool of reviewers consisting of various language experts who evaluate and categorize them accordingly. These categorized improprieties are then stored in an impropriety database for future reference by machine translator developers.

However, due to time constraints, we have left these developments for future work. Once implemented, this system could serve as an effective evaluation tool for machine translations.

7 CONCLUSION

The study investigated limitations of current translation tools in capturing the nuances of cross-cultural communication. It emphasizes the need for our attentions in detecting subtle nuances to bridge the cultural gap to empower seamless multi-lingual communication. This research also highlights real-world problems in using translator related to informal talking style, implicit meaning, and diverse conversational styles, which are often missed by existing translation systems.

In conclusion, the findings underscore the necessity for continuous improvements in translation services to better accommodate diverse cultural contexts and communication styles. By identifying limitations and pitfalls, future advancements in translation tools can enhance intercultural competence and promote more effective cross-cultural communication.

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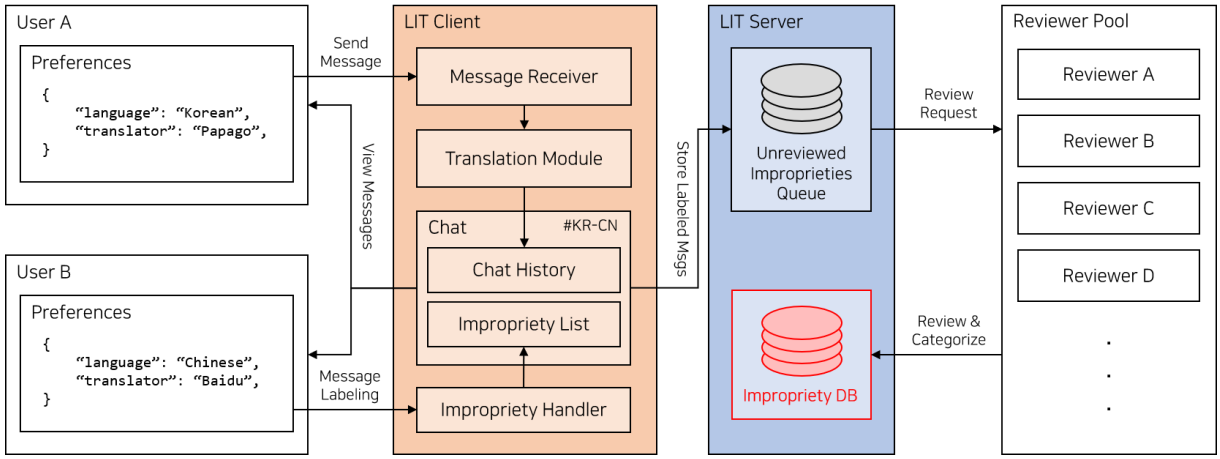

Figure 3: Future system architecture of LIT, which will be deployed to public and able to gather improprieties automatically.

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