



Application of Natural Language Processing (NLP) for Multilingual Tourism: Google Translate for Effectiveness Communication

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Authors' contributions

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ABSTRACT

This research aims to explore the application of NLP technology, specifically GT, in the context of multilingual tourism. By examining existing research, case studies, and practical applications, this review will provide a comprehensive understanding of how NLP can enhance communication effectiveness in the tourism industry. This review will contribute to the broader discourse on the integration of advanced technologies in tourism, offering insights into the practical implications and future directions for NLP applications. This study highlights the importance of accessibility for non-English speakers, bridging language gaps, and encouraging early English exposure. However, challenges such as accuracy issues and the limitations of translating complex or context-specific phrases remain significant hurdles. These limitations can affect the reliability of machine-generated

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translations, especially for languages with less widespread usage or intricate linguistic structures. The conclusion of these studies confirms that GT is a very effective tool in overcoming language barriers and improving communication in various contexts, especially in tourism.

Keywords: *Natural Language Processing (NLP); multilingual tourism; Google translate; effective communication; language barriers; cross cultural communication.*

1. INTRODUCTION

The rapid growth of the tourism industry has brought about new challenges regarding cross-language communication among travelers from various parts of the world. In an effort to enhance accessibility and traveler experience, language translation becomes a crucial key in multilingual tourism services. However, efficiently and effectively overcoming these language barriers is a complex task [1]. This is where the presence of NLP technology and artificial intelligence (AI) plays a crucial role. With the ability to understand, translate, and generate content in various languages, NLP and AI solutions offer the potential to revolutionize multilingual tourism services and significantly expand their reach [2].

NLP is a subfield of Artificial Intelligence (AI) that deals with understanding communication and generating text from NLP originating from humans which is then processed by computers [3]. NLP has been discovered since the mid-1930s and was first discovered called the "Translator Machine". Then this technology was first attempted by Germans in World War II [4]. NLP technology has shown great potential in improving the accessibility of tourism information in a multilingual context. With increasingly sophisticated algorithms, NLP systems can translate text and speech with higher accuracy, enabling travelers to communicate with local hosts and obtain information about tourist destinations more smoothly [5,6,7]. Additionally, NLP's ability to process and analyze text data from various sources, including customer reviews and social media content, also provides valuable insights for tourism service providers to enhance their service quality [8].

1.1 Tourist Language Preparation

From the data (Table 1), it is known that tourists from various countries have different habits when visiting their destinations. Countries where English is not used in daily life, such as the UAE and Mexico, tend to have the majority of their tourists learn a bit of the language of their holiday destination. Meanwhile, tourists from countries where English is commonly spoken tend to opt

not to learn the language of the country they are visiting. This is supported by data published by W3techs (<https://w3techs.com/>) that nearly 50% of translation applications use English in their services. The above data is also supported by a publication from [9 & 10], which states that 76% of 8,709 respondents in their survey indicated they prefer to make purchases or transactions with products that provide information in their native language. Another data point from [9 & 10] shows that 87% of customers are more hesitant to buy or make a purchase if product information is not provided in their native language. The data indicates that individuals generally prefer to receive information in their own language.

Table 1. Data on the number of foreign tourists who learn the basics of a language before visiting a country

Country	Learn the language of the destination country (%)	Not learning the language of the destination country (%)
All	43	24
UAE	43	22
Mexico	41	24
USA	37	38
Great Britain	35	48
Australia	34	33
France	30	40
Singapore	29	34

(Source: Fernandes, July 2022)

The COVID-19 pandemic has further highlighted the importance of NLP in various sectors, especially in tourism [11]. As global travel restrictions ease and the tourism industry begins to recover, the need for effective communication tools has become more critical than ever. In the context of multilingual tourism, NLP technology is essential in bridging language barriers and facilitating seamless interactions between tourists and locals [12]. For instance, NLP-powered translation applications can help travelers navigate new destinations, order food, book accommodations, and seek assistance in

emergencies, all in their native language. Moreover, NLP can support tourism businesses by enabling them to offer personalized destination services and recommendations based on the linguistic and cultural preferences of their customers [13]. By processing large volumes of text data from travel blogs, review sites, and social media platforms, NLP algorithms can identify trends and preferences, allowing businesses to tailor their offerings to meet the specific needs of diverse tourist groups. This capability is particularly valuable in a post-pandemic world where tourists are more cautious and seek reliable and accurate information about health protocols, safety measures, and local regulations [14].

However, despite its significant potential benefits, the implementation of NLP technology in multilingual tourism services also faces several challenges. One of them is the diversity of languages and dialects existing worldwide, which requires careful adaptation and training to ensure optimal translation quality [14]. Despite that NLP technology has so many tools, one of them is GT that has emerged as one of the most popular and widely used applications, offering translation services in numerous languages [15]. This tool has the potential to revolutionize communication in the tourism industry by enabling seamless interactions between tourists and locals. Currently, there are many types of NLP that offer features for translation, whether in text, voice, image, or "live" formats. Some that have gained a strong reputation and are well-known globally include GT, with 1 billion users and support for over 108 languages with various translation features, and Microsoft Bing, which supports 130 languages. Additionally, various types of AI (Artificial Intelligence) can now perform translation tasks accurately, such as DeepL, which can translate documents using AI in its system, and ChatGPT, which has rapidly advanced and can now even translate live conversations in real-time across different languages. In terms of user statistics, GT leads with 1 billion users. According to data published back in 2013, GT managed to satisfy approximately 200 million users with more than 1 billion translations. This figure is expected to be significantly higher now, considering that at the time, GT had fewer than 100 million users, with features limited only to text translation [16,17].

1.2 Translation Accuracy

Table 2 compares the accuracy of phrase translations from English to other languages

using three different translation platforms: **Bard**, **Tarzan**, and **Fail**. **Bard** refers to the translation system developed by Google, which is part of their AI-powered search and services. **Tarzan** is an alternative translation platform that uses machine learning technology to interpret various languages, providing more accurate translations in certain contexts. **Fail**, on the other hand, is a platform that tends to have lower accuracy compared to Bard and Tarzan, often providing less accurate or contextually inappropriate translations. Overall, **Fail** demonstrates higher accuracy in most cases, such as "out cold," "out of milk," and "out of steam," where its accuracy exceeds 80%. **Tarzan** is also fairly accurate, especially for phrases like "fly out of London" and "out of breath," with higher scores than Bard. Meanwhile, **Bard** generally shows lower accuracy, as seen in phrases like "like a bat out of hell" or "out of his mind," where its accuracy ranges from 2% to 35%. Nevertheless, Tarzan and Fail often provide more accurate translations for idiomatic expressions and specific contexts, whereas Bard still struggles with translating more nuanced meanings. Overall, this table highlights significant differences in translation quality across the three platforms, with **Fail** frequently delivering the most accurate results.

Waruwu [18] conducted a study or test on the accuracy of GT in translating sentences. The research was carried out by translating several commonly used English sentences into 108 other languages available on GT. The results showed that the majority of languages translated into other languages were at a level understandable by humans but did not fully translate the language contextually or with precise diction. The study indicates that the use of GT is considered quite effective in facilitating understanding during the translation process, even though the translated language does not always follow proper diction rules or account for context. The effectiveness of GT in enhancing communication within the tourism sector merits comprehensive examination. Its ability to provide instant translations can significantly improve tourists' experiences by making it easier for them to navigate unfamiliar environments, access services, and engage with local culture [19]. The accuracy of translations can vary, especially for languages with complex grammar structures or idiomatic expressions. Cultural nuances and contextual meanings can sometimes be lost or misinterpreted, leading to potential misunderstandings [12]. Additionally, the reliance on technology requires consistent internet

Table 2. Phrase translate scoring on Google translate

Phrase	Translation from English to another language	Bard	Tarzan	Fail
fly out of London	take an airplane from London	35.20%	79.00%	21.00%
like a bat out of hell	escaping as quickly as possible	2.40%	23.80%	76.20%
out cold	unconscious	3.80%	9.50%	90.50%
out of bounds	unacceptable	6.70%	41.00%	59.00%
out of breath	gasping for air (for example, after running)	34.80%	64.80%	35.20%
out of curiosity	because a person is casually interested in something	33.30%	65.70%	34.30%
out of focus	not clear to see (blurry)	21.90%	49.50%	50.50%
out of his mind	crazy	4.80%	28.60%	71.40%
out of milk	the supply of milk is finished	4.30%	19.00%	81.00%
out of order	does not function (broken)	31.90%	50.50%	49.50%
out of pocket	paid for something from personal money	15.20%	50.50%	49.50%
out of steam	no more energy (exhausted)	3.30%	10.50%	89.50%
out of style	unfashionable	21.90%	64.80%	35.20%
out of the closet	openly homosexual	9.50%	24.80%	75.20%
out of the game	no longer participating in a game	32.40%	68.60%	31.40%

(Source: Benjamin, 2019 [51])

access, which may not always be available in remote or underdeveloped areas. The same research is conducted by Rashid et al. [20], who utilized qualitative research methods in the form of literature studies to examine GT as a solution to language barriers, specifically focusing on Malaysian tourism. The study highlights how this application enables users to translate both text and speech, facilitating improved communication during travel. However, the challenges of language barriers remain significant, often leading to misunderstandings and frustration among travelers and locals alike. In addition to GT, the presence of mobile applications such as i-Translate, Duolingo, HelloTalk, Triplingo, Waygo, and Tandem offers a broader array of solutions to these communication hurdles. Many of these applications serve dual purposes as interpreters and dictionaries, providing users with the ability to overcome language obstacles more effectively. Notably, some applications can interpret signage by capturing photos and converting audio to text, further alleviating the difficulties posed by language differences. Rashid's literature review underscores real-life cases that illustrate the effectiveness of these technologies in enhancing communication in the context of Malaysian tourism.

This research aims to explore the application of NLP, specifically GT, in the context of multilingual tourism. By examining existing research, case studies, and practical applications, this review will provide a comprehensive understanding of how GT can

enhance communication effectiveness in the tourism industry [21,22]. It will also address the challenges and limitations associated with its use and suggest potential improvements to maximize its benefits. In doing so, this review will contribute to the broader discourse on the integration of advanced technologies in tourism, offering insights into the practical implications and future directions for NLP applications. The goal is to provide a nuanced perspective on the role of GT in overcoming language barriers, thereby enhancing the overall travel experience and operational efficiency within the tourism sector.

2. LITERATURE REVIEW

2.1 Natural Language Processing

According to Rantung & ST [23], in his book entitled Natural Language Processing techniques (NLP), NLP is a subfield of computer science and Artificial Intelligence (AI) that focuses on capabilities machines to understand and process human language in an effective and accurate manner. NLP involves the development of algorithms and computational models that can analyze, understand, and reproduce human language, both spoken and written. NLP techniques are used to solve various language related tasks, such as speech recognition, language translation, sentiment analysis, chatbots, text summarization, and many more. Then continued with a book by Auliya & Par [24] which said that NLP can increase tourist attraction because of the availability of foreign

language services such as sign boards and information centers that use English so this will make it very easy and provide effectiveness for foreign tourists in searching for information or understanding all types of material contained in the tourist attraction itself. This is also supported by international commitment, especially in the tourism sector, to improve the quality of life from one generation to the next by implementing sustainable development (SDG/Sustainable Development Goals).

2.2 Effective Communication

Effective communication is communication that occurs at any time the message sent by the communicator to the recipient of the message (communicant) can be well or the same as the message intended by the sender message, so that there are no misperceptions [25]. When delivering a message, the sender needs to ensure whether the message sent has been received properly both by the recipient of the message. Meanwhile, the recipient of the message needs to concentrate messages can be received well and provide feedback (feedback) to the sender. Feedback is important as a clarification process for ensure that there is no misinterpretation of the message conveyed. One of the most commonly used communication models across various fields, including tourism, is the [26], which is known as the most basic communication model. This model emphasizes the importance of the process of sending and receiving messages, taking into account elements such as the sender, encoding, channel, decoding, receiver, and noise. In the context of tourism, the sender can be tourism service providers, such as tour guides or hotel staff, who convey important information to tourists. The

receiver is the tourist who comes from various countries, where language differences become a barrier to effective communication. Noise in this communication can come in the form of language barriers, translation errors, or cultural context that is not understood by one of the parties.

According to Nainggolan and Nainggolan [27], Effective communication can be defined as a systematic approach encourage clear communication, use of verbal and nonverbal signals appropriate, and mutual understanding between the communicator and the recipient. Effective Communication involves capturing and conveying information clearly, timely and effectively. In a personal environment, communication is can effectively encourage learning and foster stronger relationships, thereby creating a more harmonious environment.

2.3 Multilingual Tourism

According to Abdullah and Wulung [28], said that multilingual services in tourism are a service aimed at foreign tourists. The use of multilingualism in the region tourist attractions can help foreign tourists understand the meaning and the intent of the media that has been provided. According to Tănăsescu [29], The concept of multilingual tourism is a tourism concept that can create intercultural dialogue and promotion of sustainable tourism, stimulates the exchange of ideas, creation and innovation, generates long-term jobs. By enabling communication across different languages, multilingual tourism facilitates deeper connections between travelers and local communities, enriching cultural exchanges and mutual understanding.

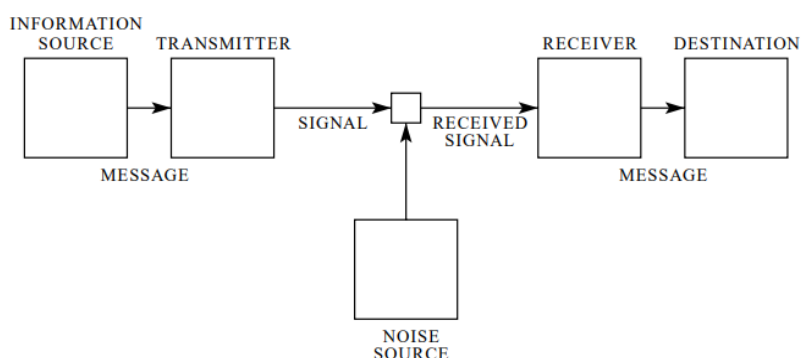


Fig. 1. Shannon-Weaver communication model schematic diagram

2.4 Google Translate

- **Accuracy:** GT is a neural machine translation service that supports multiple languages and is widely used among internet users. In a study conducted by Ramadasa et al. [30], it was found that GT provides translations for over 2 billion words, offering more language options than other platforms. Research evaluating the accuracy of GT highlights key assessment indicators, including accuracy, diction, and correct grammar usage. The study by Teach You Backwards further confirms that GT produces translations that are generally understandable, achieving a fairly good score in accuracy assessments.
- **Use of Google Translate:** GT allows users to translate text, documents, and website content. Users can access the service via its website, mobile apps, or an API for integration [30]. The process of using GT begins by typing or copying the text to be translated into the platform. The first step involves selecting the source language, followed by choosing the target language, and then typing or pasting the specific text for translation. Additionally, a study by Wirantaka and Fijanah indicates that GT can also function as a tool for correcting grammar and spelling mistakes.
- **Easy Access:** One of the main advantages of GT is its easy access across various platforms. It is available on the web and as mobile applications, making it convenient for users to utilize the service anytime and anywhere. The seamless integration through the API also allows developers to incorporate translation capabilities into their applications, further expanding its accessibility. This wide availability ensures that users can overcome language barriers effortlessly, enhancing communication in diverse contexts. For instance, a study investigating the effectiveness of using GT as a translingual Computer-Assisted Language Learning (CALL) tool in English as a Foreign Language (EFL) writing highlighted how easily accessible tools like GT can impact student performance [31]. In this study, both more proficient Chinese English major university students and less-proficient non-English majors watched a 5-minute passage from a movie and were then asked to write an extemporaneous reflective essay, demonstrating the

practical application of GT in supporting language learning and writing tasks.

3. METHODOLOGY

The research method that will be used in this research is a qualitative method. Qualitative methods are something research techniques that use narratives or words to explain and explain the meaning of each phenomenon, symptom and particular social situation [18]. The sampling technique used was a literature review. Literature study or literature review is one of the techniques for collecting data carried out through the process of providing studies or research studies from books or literacy others relevant to the research topic [32]. The data in this research is secondary data obtained from national and international journal sources that are published digitally on Google Scholar, Science Direct, and Mendeley. This research uses 20 journals sourced from these platforms, with the specification that the journals were published less than five years ago. The data was gathered by searching for specific keywords on these sources, and the keywords used were "Natural Language Processing (NLP)," "Google Translate," and "tourism.". For each keyword, at least 10,000 journals were found discussing the respective term. From the numerous journal options available, the journals selected as data for this literature review were those that addressed all three keywords simultaneously. Additionally, only journals that were publicly accessible without requiring access or prior purchase were chosen. There were no restrictions on the type of research used in the source journals, as long as the core discussion of the journal focused on GT as an NLP tool in tourism activities.

The sampling size of 20 journals was determined using the principle of *saturation*, meaning the selected sample size was deemed sufficient for comprehensive thematic analysis and did not require additional sources to extract new insights. Literature review method used to evaluate previous research findings and identify conceptual framework that can be used as a basis for analysis of the application of NLP to one of its products, namely GT, in the effectiveness of communication that occurs in the realm of multilingual tourism. By detailing findings from various sources literature, this research aims to contribute to greater understanding in-depth understanding of the problems faced in this journal. The analytical method used in this research is content analysis.

Content analysis is a research method that used to create a representation valid from a text or symbol into specific context [33].

4. RESULTS AND DISCUSSION

4.1 Results

Table 3. List of reviewed articles

No.	Title & Authors	Research method	Main topic
1	<i>Artificial Intelligence: Machine Translation Accuracy in Translating French-Indonesian Culinary Texts.</i> Hasyim, M., Saleh, F., Yusuf, R., & Abbas, A. (2021) [34]	Qualitative method with samples taken from the internet	GT should also improve and expand some of its existing databases such as covering more vocabulary, phrases, grammar and cultural equivalents across different languages.
2	<i>Google Translate as an Alternative Media for Translating Foreign Language Texts into Indonesian.</i> Alam, A. (2020) [35]	Descriptive qualitative approach with a literature study method.	Even though errors and irregularities were found, academics felt that this application was very helpful. The academics believe that the translation results will remain accurate as long as they match the context.
3	<i>Perception of the Importance of Mastering Mandarin to Support Services for Receptionists at the Beverly Batam Hotel.</i> Diana, D., & Simatupang, D. T. (2022) [36]	Descriptive qualitative with an interview sampling technique	They admitted that when dealing with foreign guests, they also experienced difficulties in communicating using English, so this caused the three respondents to have to use GT to communicate fluently with these foreign tourists.
4	<i>Effective Detection of Local Languages for Tourists Based on Surrounding Features.</i> Eze, T. (2022) [37]	Quantitative method	This study shows that GT system is able to detect the tourist domain and able to translate phrases from some most frequently using words without having to change or use the right setting in the system.
5	<i>The Use of Google Translate in Multifields.</i> Agil, M. S. (2023) [38]	Qualitative research methods	Researchers say that using GT is very easy and environmentally friendly, very fast, and can support translation into several languages in education needed task
6	<i>English for Community-Based Tourism: Barriers and Challenges of Local Entrepreneurs in Thailand</i> Meunchong, W., & Tachom, K. (2023) [39]	This study uses an ethnographic approach and data collection techniques used through interviews	This investigation showing that English plays a role in community-based tourism and using GT is highly effective for communicate between local entrepreneurs and international visitors
7	<i>Cross-Language Tourism News Retrieval System Using Google Translate API on SEBI Search Engine</i> Husni, H., Muntasa, A., Putro, S. S., & Osman, Z. (2023) [40]	Experimental method using both google translate and SEBI	There are several main findings in this study, namely the precision between the SEBI system and GT API, then the accuracy as a translation medium, especially for tourism news

No.	Title & Authors	Research method	Main topic
8	<i>Design and Development of Travel Assist, An App to Support Smart Tourism. International</i> Samsudin, N., Fahmy, S., Ali, I. M., & Mohamed, W. A. A. W. (2022) [41]	Quantitative method	.From the results of the questionnaire there are main findings, namely positive responses and with a score of around 4.5 for ease of use and 4.3 for user friendliness, indicating GT's effectiveness as a tourism tool.
9	<i>Chinese students' perceptions of using Google Translate as a translingual CALL tool in EFL writing</i> Shu-Chiao Tsai (2020) [31]	This study uses a qualitative research method with a descriptive approach.	GT texts showed significantly better writing performance in delivering more enriched content, using more advanced vocabulary and making fewer spelling and grammatical errors than the SW texts. RSW texts showed a significant improvement over SW versions, especially for the non-English major students.
10	<i>Mobile apps in tourism communication: The strengths and weaknesses on tourism trips</i> Rashid, R. A., Ismail, R., Ahmad, M., Abdullah, N. A. C., Zakaria, R., & Mamat, R. (2020, April) [20]	This study uses qualitative research methods in the form of literature studies,	GT as a solution to language barriers because this application allows users to translate text and speech, facilitating better communication during the journey. Then GT which also functions as an interpreter
11	<i>Social media for scholarly communication in Central Asia and its neighbouring countries</i> Gaur, P. S., & Gupta, L. (2021) [42]	The development of a model from TAM (Technology Acceptance Model)	Significant impact and ease of use, then the influence that GT is felt that Google Translate increases productivity and effectiveness to work or translate anything.
12	<i>Artificial intelligence and robotic technologies in tourism and hospitality industry</i> Kılıçhan, R., & Yılmaz, M. (2020) [43]	Literature review, conceptual analysis, evaluation of current technology, and case studies.	GT is useful as an important tool that can help tourists when traveling in terms of communication so that effective communication is created
13	<i>People-centred natural language processing for cultural tourism market: a research agenda</i> Fareed, M. W., & Amer, M. (2023) [13]	The research method used in this study is a literature review, then case studies	Accessibility for non-anglophone users so that it is easy to access academic content and improve the learning experience, then bridge the language divide so that it can serve ethnic languages
14	<i>Making Places: How the Faroe Islands Became a Visible Tourist Destination. MSc Tourism, Society and Environment</i> Haddingh, E. (2020) [44]	Analyze secondary data, utilize online sources and interviews.	The absence of Faroese in GT makes communication between foreign tourists and Faroe Island locals very difficult

No.	Title & Authors	Research method	Main topic
15	<i>Natural Language Processing (NLP) applications for hospitality and tourism sector</i> Berad, N. R. (2022) [45]	The research method used through a survey of 400 employees was invited to participate	GT is designed to bridge language barriers, then to improve communication which will improve customer satisfaction in the hospitality and tourism sector
16	<i>Development of information and communication technology: from e-tourism to smart tourism</i> Leung, R. (2022) [46]	The research method used is a literature review.	One of the roles of GT in this study is GT as a personalized service that is integrated to help solve language problems for travelers.
17	<i>Analysis of natural language processing techniques and development of Turkish named entity recognition tool for travel-tourism voice assistant.</i> Özcan, D. G. (2020) [47]	The research method used in this study is the collection of four different types of datasets	In this study, it is also mentioned that one of the tools that also contains NLP and NER systems is GT which is useful as a translation tool. GT itself has a voice recognition feature that can help tourists more easily translate one language into another.
18	<i>Evaluation of google translate in rendering English COVID-19 texts into Arabic</i> Authors: Zakaryia Almahasees; Samah Meqdadi; Yousef Albudairi [48]	The research method used in this study is a participatory observation method with manual evaluation	GT Committed a set of errors: semantic, grammatical, lexical, and punctuation. Such errors inhibit the intelligibility of the translated texts
19	<i>Exploring halal tourism in Muslim-minority countries: Muslim travellers' needs and concerns</i> Said, M. F., Adham, K. A., Muhamad, N. S. A., & Sulaiman, S. (2022) [49]	Qualitative method and the data collection technique used in this study is in the form of interviews with 13 Muslim	Muslim tourists who have visited Japan, Korea, and Taiwan feel very helped by the application in the form of GT
20	<i>Building a knowledge graph by using cross-lingual transfer method and distributed MinIE algorithm on apache spark</i> Do, P., Phan, T., Le, H., & Gupta, B. B. (2022) [50]	Combine cross-language transfer techniques, then data collection mainly from Google Search Engine and Wikipedia	GT makes it easy for foreign tourists to find out information about the tourism side in Vietnam because the access and process from GT is running well.

4.2 Discussion

4.2.1 Effectiveness of Google translate for tourism communication

GT enables communication across more than 100 languages, which significantly enhances

accessibility in tourism. Travelers can interact with locals, read signs, menus, and directions, and access services in foreign languages with ease. This broad language coverage is particularly useful for tourists visiting countries where their native language is not commonly

spoken. One of the most effective features of GT in tourism is its real-time translation capability. Travelers can use the app to translate conversations instantly, breaking language barriers when interacting with locals. This is crucial for scenarios like asking for directions, making reservations, or purchasing tickets. The ability to translate text, voice, and images makes GT versatile for various situations in tourism. For example, a tourist can translate a street sign or restaurant menu by simply pointing their camera at it, or they can communicate verbally by using the voice translation feature. GT's user-friendly interface allows travelers to quickly and easily translate languages without prior training. Whether on a website, mobile app, or using the offline mode, tourists can access translations with minimal effort, making it a convenient tool during travel. The offline mode allows travelers to download languages in advance, enabling translation services even without an internet connection. This is particularly useful in remote areas or when traveling in countries with limited internet access, ensuring uninterrupted communication. Despite its advantages, GT has limitations in terms of translation accuracy, particularly for complex sentences, idiomatic expressions, or culturally nuanced phrases.

- 1. Accuracy:** The accuracy of GT is underscored by several key findings in recent studies. One significant finding highlights the precision between the SEBI system and the GT API [51], demonstrating that GT serves as a reliable translation medium, especially for tourism-related news. This suggests that users can depend on GT for effective communication in the tourism sector, where clear and accurate information is crucial. However, despite its strengths, GT still has room for improvement. To enhance its effectiveness as a translation tool, the platform should focus on expanding its existing databases. This includes incorporating a broader range of vocabulary, phrases, and grammatical structures, as well as cultural equivalents across different languages. By addressing these gaps, GT can improve its accuracy and provide users with more contextually relevant translations, ultimately enhancing the overall user experience and supporting effective communication in diverse scenarios [28].
- 2. Communication:** GT plays a pivotal role in enhancing communication, particularly for foreign tourists seeking information

about the tourism industry in Vietnam. The ease of access and efficient processing of translations through GT significantly aid tourists in navigating local attractions, services, and cultural experiences. This accessibility ensures that language barriers are minimized, allowing travelers to engage more fully with their surroundings [34]. From Doborjeh et al. [5], GT designed specifically to bridge language gaps, GT not only facilitates basic communication but also aims to improve customer satisfaction within the hospitality and tourism sector. By enabling clearer interactions between tourists and service providers, the application enhances the overall travel experience, fostering positive relationships and encouraging repeat visits. However, challenges remain in specific contexts. For instance [50], the absence of Faroese in GT creates substantial difficulties for communication between foreign tourists and locals in the Faroe Islands. This limitation underscores the need for GT to expand its language offerings to include more regional dialects and less commonly spoken languages. Addressing such gaps would further enhance the application's effectiveness, ensuring that all tourists can enjoy seamless communication and a more enriching travel experience.

- 3. Efficiency:** Almahasees et al. [48] highlights the efficiency of GT as a valuable tool for addressing language barriers in the tourism sector. The GT system effectively detects the tourist domain and can translate phrases using some of the most frequently used words without requiring users to change settings or input specific parameters. This user-friendly functionality significantly enhances the translation experience for travelers, making it easier for them to access essential information and communicate effectively during their journeys. GT serves as a comprehensive solution for language barriers, allowing users to translate both text and speech seamlessly. This capability facilitates better communication, enabling tourists to engage with local cultures, navigate services, and seek assistance when needed. Furthermore, GT functions as an interpreter, providing real-time translations that enhance interactions between travelers and locals [52]. One of

the critical roles of GT identified in Eze [37] is its function as a personalized service integrated into the travel experience. By helping to solve language problems for travelers, GT empowers individuals to overcome communication challenges, fostering a more enjoyable and enriching travel experience. Its efficiency in translating commonly used phrases and providing instant access to translations not only aids in practical communication but also enhances tourists' overall satisfaction during their trips.

In conclusion, while GT significantly aids basic communication needs, its limitations can lead to misunderstandings or inappropriate translations in certain tourism-related situations. It generally provides comprehensible translations for straightforward conversations, such as asking for directions, ordering food, or requesting services. However, effective communication in tourism often hinges on a deep understanding of context and cultural nuances. For more detailed or complex interactions—such as negotiating or explaining intricate details—GT's effectiveness diminishes due to its challenges in grasping context and specialized vocabulary. Therefore, while it remains a valuable tool for travelers, users should be aware of its limitations and consider supplementing it with additional resources or local assistance when navigating more nuanced conversations.

4.3 Limitation of the Study

While GT plays a crucial role in facilitating basic communication for foreign tourists, its limitations can significantly impact its effectiveness in certain contexts. The application generally provides comprehensible translations for straightforward interactions, such as asking for directions, ordering food, or requesting services. However, effective communication in tourism often requires a deep understanding of context and cultural nuances. For more complex interactions, such as negotiating or explaining intricate details, GT's limitations become apparent. The tool often struggles with context and specialized vocabulary, leading to potential misunderstandings or inappropriate translations in tourism-related situations. Moreover, while GT is designed to bridge language barriers, it may not always deliver accurate translations that capture the subtleties of the target language. The absence of certain languages, like Faroese, poses challenges for effective communication

between foreign tourists and local residents, highlighting the tool's limitations in catering to diverse linguistic needs. Additionally, GT's reliance on a vast database can result in translations that, while grammatically correct, may lack the cultural context necessary for meaningful communication. This can lead to phrases that sound awkward or are out of place in specific situations, potentially diminishing the quality of the travel experience. In summary, while GT is a valuable resource for basic communication in tourism, users should be cautious of its limitations. Relying solely on the application without considering the need for contextual understanding may lead to misunderstandings. Travelers are encouraged to supplement GT with other resources or local assistance to enhance their communication experience in foreign environments.

4.4 Recommendation

Future studies should incorporate primary research methods, such as surveys or interviews with tourists and tourism professionals, to gather real-world feedback on the use of GT in various tourism contexts. This would provide more practical insights into its effectiveness and limitations beyond the literature review. To ensure a well-rounded understanding of machine translation in tourism, future studies should compare GT with other popular translation tools (e.g., DeepL, Microsoft Translator). This would allow for a more comprehensive evaluation of the best tools available for tourists and tourism professionals.

5. CONCLUSION

The conclusions of these studies confirm that GT is a very effective tool in overcoming language barriers and improving communication in various contexts, especially in tourism. GT significantly enhances the travel experience by improving **accuracy**, **communication**, and **efficiency** in the tourism sector. Its reliable translation capabilities, especially for tourism-related content, enable users to communicate effectively across languages, thereby fostering clearer interactions between tourists and service providers. Furthermore, GT's user-friendly functionality allows for seamless translations of both text and speech, facilitating better engagement with local cultures and services. However, to maximize its potential, GT must address limitations, such as expanding its language offerings and databases, ensuring that

all travelers can enjoy seamless communication. By focusing on these areas, GT can further elevate its role as an essential tool for overcoming language barriers, ultimately enhancing the overall travel experience. GT not only helps in translating culinary texts and supports language learning, but also plays an important role in facilitating communication between hotel staff and foreign tourists as well as between tourists and visitors. The use of GT has been proven to improve the communication experience by providing instant translation, making it easier to interact with local cultures, and enriching the tourist experience. Despite some limitations, such as limited language coverage and translation accuracy for less common languages, GT is generally well received and recognized for its effectiveness in improving productivity and work efficiency. This research also shows the need for further development to address these shortcomings, and the importance of integrating new technologies to improve GT's ability to meet the communication needs of users globally.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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