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Machine Translation and Tourism Discourse: A Spanish-English-French Study on the Localisation of the Websites of the Top Tourist Attractions in Spain

Traducción automática en el ámbito turístico: un estudio español-inglés-francés sobre la localización web de las principales atracciones turísticas en España

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Abstract: In the last few decades, tourism has consistently played a significant role in the Spanish economy. Spain, one of the world's most popular tourist destinations, received 9.6 million international tourists in September 2024, according to the Spanish National Institute of Statistics (INE, 2024a). Due to the significance of the tourism sector, it is particularly important that Spain's most visited tourist attractions offer high-quality information in multiple languages on their websites to ensure that as many people as possible look up the information contained therein, as businesses and other stakeholders in the tourism sector can benefit significantly from website localisation. For this study, the linguistic adequacy of the websites of Spain's top 20 tourist attractions as well as their official localised versions in English and French were analysed by taking into account a series of parameters related to best practices in web localisation (Olvera-Lobo and Castillo-Rodríguez, 2019; Tercedor Sánchez, 2005). Furthermore, the official localised websites in English and French were compared with the translation proposals of DeepL and Google Translate to assess the quality of the machine-translated tourism-themed content. The results obtained show poor quality in terms of localisation and linguistic adequacy for the official Spanish, English and French versions of the analysed websites. Regarding the overall assessment of the machine-translated content, DeepL performed better than Google Translate and outperformed the official websites localised into English in terms of linguistic quality.

Keywords: Web localisation, Translation, Translation for tourism, Machine translation, Machine translation quality assessment

Resumen: En las últimas décadas, el turismo ha desempeñado un papel importante en la economía española. España, uno de los destinos turísticos más populares del mundo, recibió 9,6 millones de turistas internacionales en septiembre de 2024 según el Instituto Nacional de Estadística (INE, 2024a). Debido a la importancia del sector turístico, es esencial que las atracciones turísticas más visitadas de España ofrezcan información de alta calidad en varios idiomas desde sus sitios web para garantizar que el mayor número posible de personas consulte la información contenida en ellos. Tanto las empresas como otras entidades del sector turístico pueden beneficiarse considerablemente de la localización de sitios web. Para este estudio, se analizó la adecuación lingüística de los sitios web en español de las 20 principales atracciones turísticas de España, así como sus versiones oficiales localizadas al inglés y francés teniendo en cuenta una serie de parámetros relacionados con buenas prácticas en localización web (Olvera-Lobo y Castillo-Rodríguez, 2019; Tercedor Sánchez, 2005). Además, se compararon los sitios web oficiales localizados en inglés y francés con las propuestas de traducción de DeepL y Google Translate para evaluar la calidad de dichas herramientas al traducir automáticamente contenido de temática turística. Los resultados obtenidos muestran una calidad deficiente en lo referido a la localización y corrección lingüística en las versiones oficiales en español, inglés y francés de los sitios web analizados. En cuanto a la evaluación de la calidad de las traducciones automáticas, DeepL arrojó mejores resultados que Google Translate y superó en calidad lingüística a los sitios web oficiales localizados al inglés.

Palabras clave: Localización web, Traducción, Traducción turística, Traducción automática, Evaluación de la calidad de traducción automática

INTRODUCTION

Spain consistently ranks among the world's most popular destinations as Spain’s tourist attractions are visited by millions of international tourists every year. Among the tourists who visit Spain the most, those from the United Kingdom, France and Germany consistently occupy the top positions (INE, 2024b). In 2022, tourism activity amounted to €155,496 million, accounting for 11.6% of Spain's gross domestic product (INE, 2023). Due to the key role played by the tourism sector in the Spanish economy, it is essential that tourist attractions offer up-to-date and trustworthy information in several languages to reach as many potential visitors as possible.

According to Suau Jiménez (2012), tourism communication encompasses two main modalities: professional communication among experts and communication between professionals and users. The communication between professionals and users takes place either directly through oral interactions or indirectly through written interactions, such as guides, brochures, specialised press, advertisements, or websites.

From researching destinations to booking accommodation and activities, tourists increasingly rely on websites for information and assistance. López González (2020) points out that touristic websites are aimed at reaching foreign customers, who make up "a demanding readership that might not travel to a destination if the website visuals and texts are not attractive enough" (p. 63). As the tourism industry continues to thrive, businesses and tourist attractions should aim at reinforcing their online presence. Moreover, promotional websites are one of the most popular tools for tourism professionals when it comes to communicating with users (Suau Jiménez, 2012, p. 145).

Agorni (2022) notes that web communication has created "web genres," hybrids of text, images, audio, music, and animation essential for capturing readers' attention (Grego, 2010; Mehler *et al.*, 2010). Translating a website involves considering linguistic and cultural factors to engage the specific target audience.

Other authors have explored the use of Machine Translation (MT) systems for translating tourism-themed content (see Fuentes-Luque and Santamaría Urbieta, 2020; Giampieri and Harper, 2023). In their study, Giampieri and Harper highlighted that MT performed surprisingly well with highly descriptive and informative texts, where no issues were noted. In addition, Fuentes-Luque and Santamaría Urbieta (2020, p. 78) also pointed out the linguistic accuracy of MT in the tourism domain, although some cultural issues were not correctly addressed.

Bearing all the above in mind, our research aimed to answer the following research questions (RQs):

1) Are the websites of Spain's top 20 tourist attractions linguistically and culturally appropriate both in their original Spanish version and in their localised English and French versions?
2) How do Google Translate (GT) and DeepL perform when translating the websites for Spain's top 20 tourist attractions into English and French compared to the official translations available on these websites?

To answer our RQs, the objectives of this study were the following:

1) To assess the linguistic quality of the websites of Spain's top 20 tourist attractions in Spanish (ES) and their official translations into English (EN) and French (FR).
2) To analyse the quality of the machine-generated translations using GT and DeepL for the websites of Spain's top 20 tourist attractions into EN and FR.
3) To compare the quality of the official EN and FR versions of the websites of Spain's top 20 tourist attractions and the GT and DeepL-generated translations into EN and FR of said websites.

1. WEB LOCALISATION

According to Jiménez-Crespo (2013), *web localisation* is a communicative, technological, textual, and cognitive process that adapts interactive digital texts for audiences worldwide, beyond the original target group. Localisation aims to enhance the comprehensibility and usability of a product, enabling its effective use across diverse global contexts (Sin-wai, 2012). By localising a website into other languages, it is possible to expand the horizons of the primary target audience, as well as to attract a larger volume of tourists who will be addressed in their mother tongue.

The web genre exhibits a unique characteristic known as *multimodality*. This refers to its capacity to blend various semiotic resources −such as words, images, and sounds− within a single communicative act (Agorni, 2022). In multimedia translation, non-linguistic elements play a key role as a support for the text and, in many cases, as a key concept to the translation (Tercedor Sánchez, 2005). These aspects must be considered by localisers, that is, professional translators who possess expertise not only on the linguistic aspects of translation but also on the cultural nuances, technical requirements, and regional variations necessary for successful localisation.

In the localisation process, it is essential to consider the target culture. Therefore, full communicative competence −including linguistic, sociolinguistic, and pragmatic subcompetences− is necessary (Gutiérrez-Artacho *et al.*, 2019)[1]. Localisers are skilled in adapting content to ensure that it resonates with the target audience and maintains its intended meaning while accounting for language, cultural references, idiomatic expressions, date and time formats, currency symbols, and other region-specific elements.

[1] For more information on translation competence, see Kelly (2002).

Occasionally, businesses and organisations overlook the global customer base they could reach by creating localised content. However, localisation is an extremely valuable tool for companies pursuing internationalisation strategies (Olvera-Lobo and Castillo-Rodríguez, 2019). Several studies indicate that users spend up to twice as long on websites localised into their first language have a more positive attitude towards them, and are nearly three times more likely to purchase a product (Baack and Singh, 2007; Singh and Pereira, 2005). Lastly, Agorni (2022) points out that "as more and more companies consider the whole world to be their market, consumers expect every company to have at least a bilingual website" (p. 33).

Due to the pivotal role of web localisation in today's interconnected world, Spanish tourist attractions should offer high-quality, localised multilingual content on their websites. Considering the culture and audience of the target audience is crucial for effective localisation.

2. MACHINE TRANSLATION FOR WEB LOCALISATION

Among the many possibilities there are to localise web content, businesses and other institutions can resort to MT for their localisation process.

Over the past few years, the improvement of MT systems has resulted from transitioning from phrase-based statistical MT systems to neural machine translation (NMT) systems (Daems and Macken, 2019). In 2014 and 2015, the first research publications on NMT emerged, and by 2016, academic and industrial research teams demonstrated that NMT systems outperformed previous approaches (Rothwell *et al.*, 2023). Kumar *et al.* (2022) highlight that, compared to the earlier statistical models, NMT models have proved their ability to capture contextual dependency of long sentences and they have become the "*de facto* standard of MT" (p. 46).

Using MT offers several advantages, such as the ability to cover a wide range of languages. MT tools can be developed *ad hoc* for a specific purpose or be accessed online free of charge. When it comes to free online MT tools, GT and DeepL are two of the most popular options. GT is a MT tool developed by Google and was initially launched in 2006. It primarily relied on Statistical Machine Translation techniques (Och, 2006). In 2016, Google incorporated neural network technology into its MT engine (Le and Schuster, 2016). As for DeepL, this NMT tool was launched in 2017 (DeepL, n.d.). These tools allow users to translate plain text, full documents or websites within seconds.

Nevertheless, several aspects need to be considered when making use of MT. While MT has improved significantly in the last decade, these tools still have limitations and can produce inaccurate translations, which could potentially lead to miscommunication issues. According to the International Organisation for Standardisation (ISO: 18587:2017, p. V):

> There is no MT system with an output which can be qualified as equal to the output of human translation and, therefore, the final quality of the translation output still depends on human translators and, for this purpose, their competence in post-editing.

In this regard, it is advisable to rely on human translators whenever possible.

3. HUMAN OUTPUT AND MACHINE TRANSLATION QUALITY ASSESSMENT

MT, MT Post-Editing (MTPE), and MT quality assessment are areas of great interest for the industry as well as for academia (see Briva-Iglesias, 2021; Kenny, 2022; O'Brien, 2022; Rico Pérez, 2024, *inter alia*).

One of the techniques used to assess the quality of MT output is human evaluation. Human evaluation of MT involves ranking exercises to compare system preferences, fluency and adequacy measures using evaluators' scores, and MTPE evaluation to assess temporal, technical, and cognitive effort (Rothwell *et al.*, 2023).

In addition, there are well-established metrics for carrying out human quality translation assessment, such as the DQF-MQM Error Typology. This framework serves as a resource for assessing both human translation quality as well as MT output quality (TAUS, n.d.). It provides a systematic approach for categorising and assessing translation quality and was developed by the Translation Automation User Society (TAUS), a translation industry think tank. The DQF-MQM framework is the result of combining the Dynamic Quality Framework (DQF) and the Multidimensional Quality Metrics (MQM) error typology.

Lommel (2018) states that after the Localisation Industry Standards Association (LISA) ceased operations, two groups took on active roles in translation quality assessment: i) TAUS, and ii) the EU-funded QT LaunchPad project, led by the German Research Centre for Artificial Intelligence (DFKI). DQF was the error typology proposed by TAUS. According to Castilho *et al.* (2018), one of the noteworthy points of the DQF is that rather than dealing with problems after the translation process, quality issues should be considered before the actual translation process begins.

As for the MQM, this error typology was developed within the frame of QTLaunchPad project to address the shortcomings of previous quality evaluation (Lommel *et al.*, 2014). Castilho *et al.* (2018) point out that MQM can apply to both professional translations and MT output. In other words, the metric is designed to assess the quality of the translation product, regardless of the method used to generate the target text.

In 2014, TAUS and DFKI began the harmonisation of DQF and MQM to bridge the gap between the definitions and specifications of the two models (Görög, 2014). The DQF and MQM are the latest large-scale initiatives aimed at standardising translation quality assessment, and they are especially relevant as they bring together approaches that initially developed independently in both research and industry (Castilho *et al.*, 2018).

The resulting harmonised framework consists of seven high-level error types, each further subdivided into more specific error categories as shown in Table 1:

High-level error type	**Granular error type**
1) Accuracy	Addition Omission Mistranslation Over-translation Under-translation Untranslated text Improper exact TM match
2) Fluency	Punctuation Spelling Grammar Grammatical register Inconsistency Link/cross-reference Character encoding
3) Terminology	Inconsistent with term base Inconsistent use of terminology
4) Style	Awkward Company style Inconsistent style Third-party style Unidiomatic
5) Design	Length Local formatting Markup Missing text Truncation/text expansion

6) Locale convention	Address format Date format Currency format Measurement format Shortcut key Telephone format
7) Verity	Culture-specific reference

Table 1. DQF-MQM error typology
Source. Summarised from TAUS DQF-MQM error typology by the authors.

4. METHODOLOGY

In this study, a methodology consisting of several phases was designed: 1) selection of Spain's top 20 tourist attractions, 2) content and sample selection, 3) analysis of the original ES version, 4) analysis of the pre-existing localised EN and FR versions, and 5) analysis of the GT and DeepL-generated translations. Each of the phases is detailed below:

4.1. Selection of Spain's top 20 tourist attractions

The tourist attractions chosen for this study were selected based on the article written by Cynthia M.R. and published in the Spanish economic journal *Expansión* in March 2022. At the time this study was conducted, the article provided the latest details on Spain's most popular tourist attractions.

Table 2 presents the chosen tourist attractions, the code assigned to each of them and a shortened link redirecting to the official website of each attraction:

Code	**Tourist attraction[2]**	**Website link**
1SF	Sagrada Familia (Barcelona)	https://t.ly/vB-Y
2ALH	Alhambra (Granada)	https://t.ly/n32V
3MEZ	Mosque-Cathedral Monumental Site of Cordoba	https://t.ly/AISF
4CST	Cathedral of Santiago (Santiago de Compostela)	https://t.ly/CYdo-
5CBU	Cathedral of Burgos	https://t.ly/azHbU

[2] The English names of the monuments are those which appear on each of their English-language websites. In cases where there is no English version of the monument's website, a literal translation is provided.

6ASG	Alcazar of Segovia	https://t.ly/A3A92
7CPM	Cathedral of Mallorca	https://t.ly/STJW
8ZGZ	Cathedral-Basilica of Nuestra Señora del Pilar (Zaragoza)	https://t.ly/2iD_
9MER	Roman Theatre (Mérida)	https://t.ly/ls6V
10GIR	Giralda (Seville)	https://t.ly/TLU7
11CMI	La Pedrera-Casa Milà (Barcelona)	https://t.ly/HgeGO
12CAC	La Ciutat de les Arts i les Ciències (Valencia)	https://t.ly/3GUu
13MRS	Museo Reina Sofía (Madrid)	https://t.ly/KaF_
14RAS	Real Alcazar (Seville)	https://t.ly/lo1a
15GUG	Guggenheim Museum (Bilbao)	https://t.ly/pWsf
16MLG	Alcazaba of Malaga	https://t.ly/VOQO
17MP	Monasterio de Piedra (Nuévalos, Zaragoza)	https://t.ly/MBgN
18MES	Royal Site of San Lorenzo de El Escorial (Madrid)	https://t.ly/Qemt
19MPR	Museo del Prado (Madrid)	https://t.ly/SMA5O
20PR	Royal Palace of Madrid	https://t.ly/AZNN

Table 2. The 20 tourist attractions selected, accompanied by their assigned code and the link to their website
Source. Elaborated by the authors

4.2. Content and sample selection

Web pages providing a general overview of each tourist attraction were selected. A sample of approximately 350 words was extracted from the ES website of each tourist attraction. In addition, the equivalent official translations into EN and FR were selected, so as to compare the same sections in all of the three official versions of the content.

When the selected web pages did not meet the 350-word threshold for the sample, other sections, such as “How to get there” or “Schedule hours”, were also included. In exceptional cases in which these sections still did not meet the minimum word threshold, some historical background information available on the website was also included.

After selecting the 20 tourist attractions, the HTML files of the websites to be analysed were downloaded to ensure access without relying on online availability. To this end, the “Save As” option in Microsoft Edge browser was used. Rather than copying and pasting plain text, downloading the web pages allowed the authors to consider parameters such as colour choice and the use

of icons when analysing the degree of localisation of each website. However, in order to assess linguistic adequacy, a single file containing plain text was generated for each tourist attraction website. The resulting document comprised the sections containing the segments to be analysed at a later stage.

4.3. Analysis of the original ES version

With the aim of assessing the linguistic quality of the content, 350 words from the ES version of each website were selected. Thus, approximately 7,000 words were analysed in total.

Errors in the original ES version were annotated by means of the DQF-MQM error typology. Even though the typology is meant to be used for assessing translations, several error types described within such framework can be used to assess monolingual content, *i.e*. punctuation, spelling, grammar, grammatical register, inconsistency, link/cross-reference character encoding, awkward, inconsistent style, unidiomatic, address format, date format, currency format, measurement format, shortcut key, telephone format, and culture-specific reference.

Firstly, each author carried out the analysis of the ES versions individually. Afterwards, both authors compared the errors which had been identified individually to eliminate any errors mistakenly categorised or which could have been identified based on a personal preference.

4.4. Analysis of the pre-existing localised EN and FR versions

In the first phase of the analysis and prior to the linguistic and cultural analysis, the degree of localisation of each website was examined by means of the following questions:

1) How many languages have the websites been localised into?
2) Is the language menu presented correctly, *i.e*. avoiding the use of flags to refer to a language?
3) Are the errors identified in the localised version a consequence of an error in the ES version?
4) Are the websites fully localised or do they contain any untranslated section?
5) Are there any errors in the localised websites? (*i.e*. untranslated content in Spanish present in the EN or FR versions)
6) Are there any errors in the cultural references present in the localised versions?

To answer these questions, the authors drew on the ideas proposed by Olvera-Lobo and Castillo-Rodríguez (2019) and Tercedor Sánchez (2005), who established various aspects to consider when assessing website localisation. According to Olvera-Lobo and Castillo-Rodríguez (2019), these aspects could be classified as linguistic, cultural, and technical issues. Tercedor Sánchez (2005) organised them into categories related to text, images, icons, graphical elements, technical features, and cognitive factors. The answers to these six questions allowed for a first overall analysis showing the amount of 1) partial localisations, 2) unlocalised websites, 3) spelling and punctuation errors, and 4) localisation errors. After this first overall analysis, an in-depth analysis of 5) linguistic and translation errors was conducted.

Regarding the analysis of linguistic and translations errors, the 350-word samples of the pre-existing EN and FR versions of the websites were considered reference translations. Such reference translations in EN and FR were segmented and aligned at sentence-level with the original segments in Spanish. Each author then compared the EN and FR reference translations with the original ES version of the websites with the aim of assessing linguistic quality as well as to examine cultural adequacy to potential readers (*i.e*. converting units into the imperial system for US readers for the English *locale*, adding Spain's telephone prefix in the EN and FR localised telephone numbers, text in multimedia content such as images and video not left untranslated, etc.). Lastly, the identified errors were annotated using the DQF-MQM error typology.

4.5. Analysis of the GT and DeepL-generated content

After analysing the ES original versions as well as the EN and FR pre-existing localised websites, an analysis of the GT and DeepL-generated translations was carried out. In order to compare the quality of the pre-existing localised websites with that of the MT-generated translations, GT and DeepL were asked to translate the same excerpts that were already available in EN and FR. As previously done, errors were annotated in accordance with the DQF-MQM error typology. The results from this annotation were used to compare the quality of the official EN and FR versions. Approximately 15,000 machine-translated words were analysed.

5. RESULTS

After concluding all the stages of the analysis, the following data were obtained. Firstly, an overview of the degree of localisation of the different websites is presented:

- 15% of the analysed websites did not offer a localised version in any other language apart from ES.
- The most translated website was that of the Guggenheim Museum, offering its content in 12 languages including ES.
- 50% of the websites were translated into languages other than EN or FR.

Table 3 shows the percentage of monuments offering their websites in languages other than ES, EN, and FR:

Language	Percentage	Available in
Catalan	30%	La Sagrada Familia, Palma de Mallorca Cathedral, La Pedrera-Casa Milà, Ciutat de les Arts i les Ciències, Museo Reina Sofía, Guggenheim Museum
Galician	15%	Santiago de Compostela Cathedral, Museo Reina Sofía, Guggenheim Museum
Italian	15%	La Pedrera-Casa Milà, Alcazaba of Málaga, Guggenheim Museum
Basque	10%	Museo Reina Sofía, Guggenheim Museum
Chinese	10%	La Pedrera-Casa Milà, Ciutat de les Arts i les Ciències
German	10%	Alcazaba of Málaga, Guggenheim Museum
Korean	10%	La Pedrera-Casa Milà, Guggenheim Museum
Portuguese	10%	Roman Theatre of Mérida, Guggenheim Museum
Arabic	5%	Alhambra
Japanese	5%	Guggenheim Museum
Russian	5%	Guggenheim Museum

Table 3. Percentage of monuments offering their websites in languages other than Spanish, English, and French
Source. Elaborated by the authors

The data reveal significant variations in the extent to which the websites have been adapted for the EN and FR *locales*. Approximately 90% of the websites were translated into EN, indicating a significant investment in catering for the English-speaking audience. This may suggest that the website content managers recognised the importance of reaching a broader English-speaking user base.

However, the data show a less extensive effort when localising the websites for the French-speaking audience. Only 30% of the websites were translated into FR, which might indicate a lower level of priority placed on catering to this language. This discrepancy between the EN and FR versions could be attributed to various factors, such as the perceived importance of each language market or resource limitations faced by the website content managers.

The following paragraphs provide a classification of the identified errors and examples of each error category after the first overall analysis:

1) Partial localisations. Six websites did not include the same information as the reference website in ES in their localised versions into EN and/or FR. This error was identified in the websites of Santiago de Compostela Cathedral, the Basílica del Pilar in Zaragoza, Seville Cathedral, La Pedrera-Casa Milà in Barcelona, La Ciutat de les Arts i les Ciències, and the Real Alcázar in Seville, which account for 30% of the analysed websites.

2) Unlocalised websites. 15% of the websites had not been localised into other languages, thus simply providing a version in ES. Although this is not an error, unlocalised websites make it difficult for non-Spanish-speaking tourists to access information. The following three monuments did not include an EN version of their websites: the Alcázar of Segovia, the Giralda[3] and Burgos Cathedral. Lastly, the following fourteen attractions did not provide a FR version of their website: Sagrada Familia, the Alhambra, Santiago de Compostela Cathedral, Burgos Cathedral, the Alcázar of Segovia, Palma de Mallorca Cathedral, the Basílica del Pilar in Zaragoza, the Roman Theatre of Mérida, the Giralda, La Ciutat de les Arts i les Ciències, Museo Reina Sofía, the Royal Site of San Lorenzo de El Escorial, Museo del Prado and the Royal Palace (Madrid).

[3] In the early stages of this research, the Giralda website offered an English version. However, during the final stages of this work, the website discontinued its localised English version. At the time of this article's submission, the content was available only in Spanish.

3) Spelling and punctuation errors. Among the websites analysed, 30% exhibited punctuation errors, including instances where the symbol "€" was incorrectly placed after the numerical value in localised content in English.

4) Localisation errors. Localisation errors encompass instances where content, such as weights and measures, is not appropriately adapted to the target language and culture. Additionally, leaving text untranslated within images or videos is also considered a localisation error.

Six websites used flags as icons for the language switching menu. The use of flags on websites for switching between languages has long been considered inadvisable (Tercedor Sánchez, 2005). Associating a flag of a country with a language sets aside other countries in which that language is also spoken.

Instead, using codes for the representation of names of languages is preferred, such as those suggested in ISO 639:2023, which comprises language code elements of one to three language identifiers. In total, 75% of the analysed websites had localisation errors, and 30% of them had resorted to flags for the language switching menu.

5) Linguistic and translation errors. Linguistic and translation errors were annotated through TAUS DQF-MQM error typology. The results are shown in the following sections.

5.1. Results obtained from the analysis of the ES version of the websites

The samples of the original ES versions of the websites had 37 errors. The analysis of the content of the websites in ES revealed that all the examined websites had at least one spelling and/or punctuation error. This suggests that there may have been some oversight or lack of attention to detail during the creation or maintenance of these websites.

Table 4 includes an example for each identified error, along with the corresponding text code:

Identified errors	Example of erroneous segment	Justification
18 punctuation errors	10GIR, ES: El Cabildo de la Catedral, tiene como objetivo prioritario el poder brindar a sus visitantes cuantos recursos de accesibilidad, servicios de apoyo e información útil tenga a su alcance [...].	In Spanish, it is incorrect to place a comma between the subject and the predicate.
14 spelling errors	9MER, ES: Al quedar arruinadas desde antiguo las bóvedas de los accesos, *sólo* quedaban en *pié* los siete cuerpos de sus gradas.	Neither the adverb "solo" nor the noun "pie" in Spanish carry accent marks.
3 inconsistencies	1SF, ES: Rogamos a los asistentes que *adopten* una conducta respetuosa y vistan decorosamente. Si *venís* en grupo de más de 25 personas [...].	The sentence begins addressing the reader in a formal tone by using the form "(ustedes) adopten" but then shifts to the informal "(vosotros) venís".
2 errors classified as "others"	7CPM, ES: El precio, en el que se incluye la entrada a la Catedral *a* y a sus terrazas.	The preposition "a" before the conjunction "y" is superfluous and could be a typo.

Table 4. Number and type of errors present in the ES version sample extracted from the 20 websites
Source. Elaborated by the authors

As can be seen, the errors are mostly due to a presumed lack of attention or unawareness of the orthographic rules and conventions of the Spanish language. The inconsistencies and errors that fall into the "others" category suggest that the content might not have been proofread before publishing.

5.2. Results obtained from the analysis of the EN version of the websites

Figure 1 presents the errors identified in the localised EN version as well as in the EN machine-translated content:

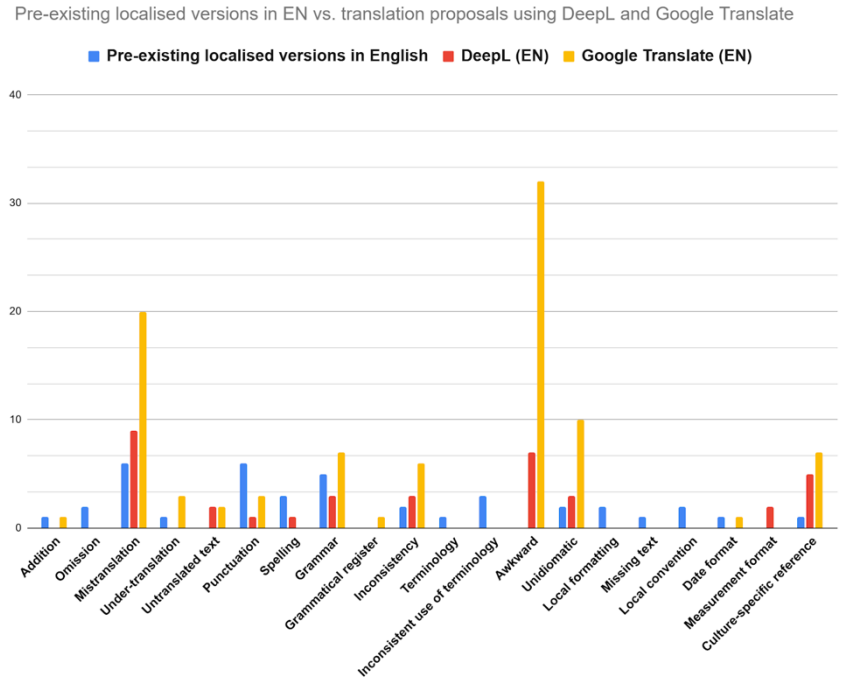

Figure 1. Errors in the localised EN versions *vs.* errors in the MT-generated versions into EN by Google Translate and DeepL
Source: Elaborated by the authors

In general, the pre-existing EN versions of the websites had a great variety of errors, but the overall number of errors was significantly lower than in the EN GT-translated content and only slightly higher than in the EN DeepL-translated version. Both MT systems exhibited notably superior performance in punctuation, as GT and DeepL improved the punctuation in the translations they produced, with DeepL producing texts with almost no punctuation errors. It is especially noteworthy that the main errors detected in the MT-generated translations fell into the categories of “mistranslation,” “unidiomatic,” “culture-specific reference,” and notably, “awkward.”

The following sections present the results obtained from the analysis of the EN versions. Firstly, the results of the analysis of the pre-existing localised EN versions are provided, followed by the results of the analysis of the MT-generated contents.

5.2.1. Results obtained from the official localised version of the websites

The sample of the localised EN versions of the websites contained 39 errors. An example for each error category is provided in Table 5:

Identified errors	Example of erroneous segment	Justification
6 mistranslations	14RAS, ES: El Alcázar hasta el siglo XIV 14RAS, EN: The Alcazar up to the nineteenth century	The translation does not accurately represent the century mentioned in the ES source text.
6 punctuation errors	8ZGZ, EN: 9.00 €	The euro sign (€) should precede the numerical value.
5 grammar errors	18MES, EN: EVERY DAYS	The noun is in plural form when it should be singular.
3 terminology inconsistencies	8ZGZ, EN: Cathedral of Salvador. [...] Cathedral of El Salvador.	The name of the monument was not translated consistently.
3 spelling errors	16MLG, EN: *muslum* art in Spain	"Muslim" was spelled incorrectly.
2 inconsistencies	13MRS, EN: The Museo Reina Sofía has four different venues: the Main Venue, made up of the Sabatini Building and the Nouvel Building, and the Parque del Retiro, Palacio de Velázquez and the Palacio de Cristal.	Unlike the other sites listed, "Palacio de Velázquez" does not include the article "the".
2 unidiomatic phrases	8ZGZ, ES: CÓMO LLEGAR. 8ZGZ, EN: HOW TO GET.	The intended meaning is not accurately conveyed by the literal translation.

2 errors concerning local formatting	17MP, ES: El Monasterio se construye en la transición del Románico al Gótico. 17MP, EN: THE MONASTERY WAS BUILT DURING THE TRANSITION FROM ROMANESQUE TO GOTHIC.	The source text does not capitalise the segment, thus capitalisation is not required in the English version.
2 omissions	2ALH, ES: La Alhambra fue ciudad palatina, [...] hasta llegar a su declaración como monumento nacional en 1870. 2ALH, EN: The Alhambra was a palatine city, [...] until its declaration as a Monument in 1870.	The English translation only conveyed the meaning of “Monument”, without further explanation.
2 *locale* convention errors	15GUG, EN: With 24,000 m2, of which 9.000 are dedicated to exhibition space [...].	In English grammar, the common practice for separating thousands is to use a comma as a thousands separator. Therefore, the format “9.000” is incorrect and directly transposed from the Spanish language.
1 error related to missing text	20PR, ES: 24 de diciembre: cerrado a partir de las 15:00 (cierre taquillas a las 14:00). 20PR, EN: December 24: closed from 15:00.	The Spanish source text provides information about the closing time of the ticket offices, which was not included in the English translation.
1 addition	11CMI, ES: En 1900 el PASEO DE GRACIA era la avenida más importante de la ciudad […]. 11CMI, EN: In *the year* 1900, Passeig de Gràcia was the most important avenue in Barcelona […].	The English version contains “the year,” which is potentially unnecessary since the context already implies that 1900 refers to a year.

1 date-and-time-format error	7CPM, EN: The visits are unguided and the opening hours are Monday to Friday 10:00 to 16:30 and Saturday 10:00 to 13:30.	In informal settings, the 12-hour format is more commonly used in English. In American English, the 12-hour is also much more used than the 24-hour format.
1 culture-specific reference error	2ALH, ES: Con la revolución de 1868 la Alhambra queda desligada de la Corona [...]. 2ALH, EN: With *the revolutions of 1868*, the Alhambra was *disconnected* from the Crown [...].	"La Revolución de 1868" is known in English as "The Glorious Revolution."
1 under-translation	4CST, ES: El Botafumeiro [...] está suspendido a una altura de 20 metros y puede alcanzar los 68 km/h. 4CST, EN: The Botafumeiro [...] hangs from a height of 20 metres and can pick up *great speed*.	The Spanish text conveyed the speed the censer reaches.
1 terminology error	2ALH, ES: Con la revolución de 1868 la Alhambra queda desligada de la Corona [...]. 2ALH, EN: With the revolutions of 1868, the Alhambra was *disconnected* from the Crown [...].	The verb "disconnected" does not accurately convey the intended meaning of the source text.

Table 5. Number and type of errors present in the localised English version of the websites
Source: Elaborated by the authors

The number of errors (39) is practically identical to those identified in the original ES version (37). However, not all the websites had an EN version, resulting in a proportionately higher number of errors in the EN versions compared to the original ES websites. As for the identified errors, they are similar in nature to those identified in the original ES version.

Errors such as mistranslations, under-translations, omissions, and those related to culture might suggest a lack of certain translation skills among the teams that translated the content. In contrast, errors related to punctuation, grammar, spelling, and *locale* conventions could be explained by an insufficient EN level or a lack of thorough proofreading.

5.2.2. Results obtained from the MT-generated content using GT and DeepL

The sample of the EN websites translated using GT contained 93 errors, while the sample translated using DeepL had 36. Table 6 provides some translation proposals by GT and DeepL into English:

Original segment in Spanish	Translated using Google Translate	Translated using DeepL
1) 16MLG: Ofrecer una visión amplia y global de la historia de España de una forma amena y entretenida, es el ambicioso objetivo de esta entrada.	Offering a broad and global vision of the history of Spain in a pleasant and entertaining way, is the ambitious objective of this entry.	To offer a broad and global vision of the history of Spain in a pleasant and entertaining way is the ambitious aim of this entry.
2) 15GUG: El Museo está rodeado de atractivos paseos y plazas en una zona de reciente urbanización, superado su pasado industrial.	The Museum is surrounded by attractive promenades and squares in a recently urbanized area, *its industrial past gone*.	The Museum is surrounded by attractive promenades and squares in an area of recent urbanisation, having overcome its industrial past.
3) 20PR: 1 de enero: cerrado en jornada completa 6 de enero: cerrado en jornada completa 1 de mayo: cerrado en jornada completa	January 1: closed full time January 6: closed *for the whole day* May 1: closed full time	1 January: closed for the full day 6 January: closed for the full day 1 May: closed for the full day

Table 6. Examples of some translation proposals using Google Translate and DeepL into English
Source. Elaborated by the authors

As can be seen, DeepL outperforms GT in translation quality. GT frequently produces literal translations, as seen in its replication of elements from the original ES sentence, such as the comma between subject and predicate in the 16MLG fragment. In contrast, DeepL takes a more natural approach to translation.

Many of the identified errors fell under the “awkward” category, where numerous instances of ES structures were translated literally into EN. One example can be seen in the 15GUG fragment presented in Table 6. GT translates *superado su pasado industrial* as “its industrial past gone”, which appears awkward, especially when compared to DeepL’s “having overcome its industrial”, a potentially more natural way to express the original ES message in EN. Another example (not shown in Table 6) is the sentence *el horario de entrada será de lunes a viernes de 10:00h a 16:30h*. This sentence is built using the future tense of the verb in ES. GT produced the following literal translation: “the entrance hours *will be* from Monday to Friday from 10:00 a.m. to 4:30 p.m.”, which resulted in awkward phrasing. In contrast, DeepL produced a more natural translation in EN by using the present tense and suggested the following sentence: “the entrance hours are from Monday to Friday from 10:00h to 16:30h.” Lastly, GT also produced an inconsistency when translating the opening hours of the Royal Palace in Madrid, as shown in the third example of Table 6.

5.3 Results obtained from the analysis of the FR version of the websites

Figure 2 presents the number of errors identified in the localised FR versions as well as in the MT-generated content into FR. The results show the error categories that had at least one instance:

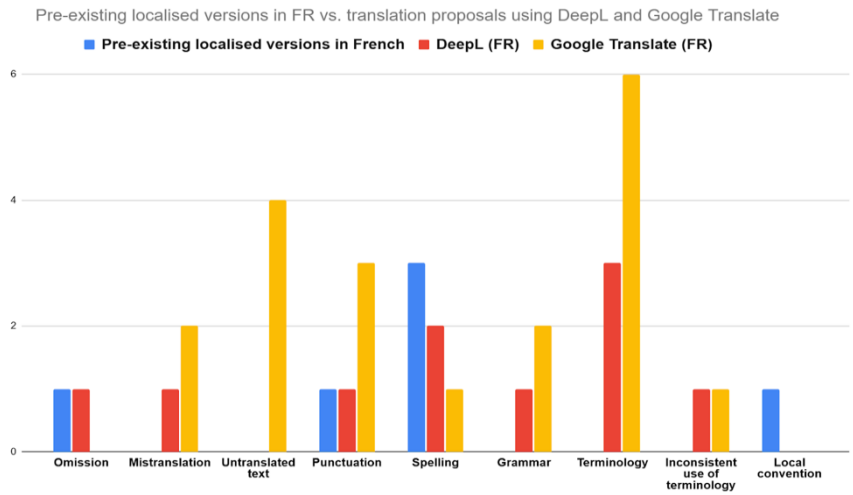

Figure 2. Errors in the localised FR versions *vs*. errors in the FR MT-generated versions by GT and DeepL
Source. Elaborated by the authors

As can be seen, the MT-generated texts into FR featured more errors than the pre-existing FR versions. MT performed significantly worse in issues related to terminology, grammar and punctuation, while only outperformed the pre-existing FR version in spelling and adequacy to *locale* conventions.

The following sections provide more detailed results from the analysis of the FR versions. Firstly, the results of the analysis of the pre-existing localised FR versions are provided, followed by the results of the analysis of the MT-generated contents.

5.3.1 Results obtained from the official localised FR version of the websites

The localised FR content from the analysed sample of all websites contained six errors. It is important to note that only 30% of the websites provided a localised FR version, which explains the lower absolute number of errors compared to the ES and EN versions. An example for each error category is provided in Table 7:

Identified errors	Example of erroneous segment	Justification
1 omission error	14RAS, ES: Este Palacio de al-Mubarak, *el Bendito*, fue ya el centro de la vida oficial y literaria de la ciudad. 14RAS, FR: Ce palais d´al-Mubarak fut le centre de la vie officielle et littéraire de la ville.	The omission of "El Bendito" is not deemed justified.
1 punctuation error	14RAS, FR: [...] la construction d´une nouvelle enceinte.	Incorrect punctuation mark used instead of the apostrophe in the contraction "d'une".
3 spelling errors	15GUG, FR: Une fois sur la place, le promeneur accède au Vestibule en descendant un large escalier, un recours architectural peu fréquent qui résout ici avec bonheur la différence entre la *cote* de la ria du Nervión.	The absence of a circumflex accent in the word "côte" changes the intended meaning. The error is not due to a drafting mistake in the original Spanish version.

1 *locale* convention error	15GUG, FR: Avec ses *24 000* m2 de superficie, dont *9.000* destinés aux expositions.	Inconsistency when separating thousands.

Table 7. Number and type of errors present in the localised FR version of the websites
Source. Elaborated by the authors

For the first example in Table 7, the translator might have overlooked the significance of "El Bendito" or assumed it was unnecessary. The second example, while a minor error that a tourist might leave unnoticed, indicates a lapse in attention to detail. Regarding the third error, it is a spelling error where *cote*, meaning 'quotation', 'rating', or 'dimension,' is used instead of *côte*, meaning 'shoreline,' significantly altering the intended meaning. Again, while a tourist might infer the intended meaning, such errors can slightly affect their perception of the information. For the fourth example, the translator might have followed a different *locale* convention or overlooked the standard French practice when separating thousands. Therefore, certain errors identified could result from the website localiser lacking adequate FR language proficiency, including issues related to spelling, punctuation, or *locale* conventions.

5.3.2 Results obtained from the MT-generated content using GT and DeepL

When it comes to the MT-generated versions of the websites translated into French, DeepL had 10 errors, while GT had 19. DeepL produced better texts than GT, as it did when translating the sample into EN. Many of the errors identified repeated patterns shown in the previous tables. Some examples of the FR sample are included in Table 8:

Original segment in Spanish	Translated using Google Translate	Translated using DeepL
1) 17MP: Disfruta de la bella arquitectura sobria y luminosa que caracteriza la transición del ROMÁNICO AL GÓTICO CISTERCIENSE.	Appréciez la belle architecture sobre et lumineuse qui caractérise la transition du ROMAN AU GOTHIQUE CISTERCIEN.	Profitez de la belle architecture sobre et lumineuse qui caractérise la transition entre le *gotic* ROMAIN et le *gotic* CISTERTIEN.
2) 3MEZ: Mezquita fundacional de Abderramán I	Mosquée fondatrice d'*Abderramán I*	Mosquée fondatrice d'Abderraman Ier
3) 15GUG: La plaza y la entrada principal del Museo se encuentran enfilando la calle Iparragirre [...].	La place et l'entrée principale du Musée sont situées le long de *la Calle* Iparragirre [...].	La place et l'entrée principale du musée sont situées le long de la rue Iparragirre [...].

(4) 15GUG: [...] el edificio representa un hito arquitectónico por su audaz configuración y su diseño innovador, conformando un seductor telón de fondo para el arte que en él se exhibe.	[...] le bâtiment représente un repère architectural par sa configuration audacieuse et son design innovant, formant un écrin séduisant pour l'art qui y est exposé.	[...] le bâtiment représente un point de repère architectural pour sa configuration audacieuse et son design innovant, formant une toile de fond séduisante pour l'*art exposé*.

Table 8. Translation proposals using Google Translate and DeepL into French
Source. Elaborated by the authors

Terminology-related errors were among the most frequent ones. In the first example shown in Table 8, the original *ROMÁNICO AL GÓTICO CISTERCIENSE* was translated by GT as "ROMAN AU GOTHIQUE CISTERCIEN" and by DeepL as "entre le GOTIC ROMAIN et le GOTIC CISTERTIEN". DeepL provides a completely wrong translation that includes a spelling error (*cistertien* instead of *cistercien*) and two wrong terminology choices ("gotic", which is not a word in French, instead of *gothique*, and *romain*, instead of the notably more appropriate *roman*).

There were also errors identified in the FR MT-generated content that fell into the category of "untranslated text". This was the case for the second example in Table 8, as *Abderramán I* was left untranslated in GT's version, while DeepL omitted the accent mark and translated *I* for "1er"). DeepL seems to have attempted an adaptation of the proper noun to the French language. Another instance of an untranslated word appears in the third example, where GT keeps the original *la calle*, while DeepL correctly translates it to the French equivalent, "rue." Since *calle* is not part of the name itself, DeepL's translation is more accurate and avoids the error made by GT.

Lastly, for the fourth example, which is not a translation error, GT provided a more detailed expression, emphasising the location (*l'art qui y est exposé*) where the art is exhibited, whereas DeepL provided a more literal translation (*pour l'art exposé*).

6. Discussion

The answers to the RQs will be discussed in this section. As a reminder, this paper's RQs were the following:

> RQ1: Are the websites of Spain's top 20 tourist attractions linguistically and culturally appropriate both in their original Spanish version and in their localised English and French versions?

RQ2: How do GT and DeepL perform when translating the websites for Spain's top 20 tourist attractions into English and French compared to the official translations available on these websites?

To address the first RQ, an overall analysis of the degree of localisation of the websites was conducted. It was observed that the content of the 20 websites was unevenly presented; some websites stood out for their comprehensive information, while others provided outdated or minimal information. The number of websites offering localised versions in EN and FR was also uneven. While 90% of the websites offered EN versions, only 30% had FR versions. As previously mentioned, the discrepancy between the English and French versions could be due to several factors, such as the perceived importance of each language market or resource limitations faced by the website content managers. Given that EN is the world's *lingua franca*, it seems evident that priority was given to translating websites into EN. This decision might come from an assumption that tourists from non-English-speaking countries possess some knowledge of English.

Regarding the linguistic and cultural appropriateness of the localised versions, one of the main issues was the misuse of the language selection menu through the use of flags, which is nowadays discouraged and should be replaced by standardised codes for each language (Olvera-Lobo and Castillo-Rodríguez, 2019; Tercedor Sánchez, 2005).

Regarding the linguistic quality of the original websites in ES, many errors were identified, such as outdated spelling (accent mark for the adverb *sólo*) and misspellings (the adjective *éstas puertas*, the noun *pié*). As for the official localised versions into EN and FR, several typos, punctuation and spelling errors, as well as literal translations and terminological inconsistencies were identified (8ZGZ, EN: Cathedral of Salvador, Cathedral of El Salvador).

The repeated occurrence of such errors revealed the need to improve the quality of the analysed websites, as localisation and spelling errors could have been avoided by experts such as localisers, proofreaders, or content creators. Nevertheless, translation quality can still vary depending on the specific context, content, and translator's expertise. Overall, these findings highlight the need for meticulous attention to detail in the original ES versions of websites to avoid spelling and punctuation errors. Additionally, they emphasise the importance of considering the linguistic diversity of the target audience when localising websites. In summary, addressing RQ1, while the original versions in ES and the official localised EN and FR versions are not inappropriate, they do require further refinement.

Regarding our second RQ, DeepL consistently outperformed GT when it came to translation accuracy, as DeepL's results produced more fluent translations both in EN and FR. This was also the conclusion reached by Hidalgo-Ternero (2021) in his comparative study of machine-translated phraseology from ES into EN using GT and DeepL. In addition, Peña Aguilar (2023) examined specific linguistic challenges in translating between ES and EN. In her study, she demonstrated that DeepL outperformed other popular MT systems, such as Bing and GT, by correcting some problems present in the source text. Our study confirms this finding, as shown in the first example of Table 6, where DeepL did not replicate the error present in the original Spanish version (a comma between the subject and predicate, an error that GT did replicate). The tendency toward literal translation by MT tools (in our study, especially by GT) was also pointed out in Fuentes-Luque and Santamaría Urbieta's (2020) study on the performance of MT when translating tourism texts in the English-Spanish combination.

While GT has made significant strides over the years, it still occasionally fell short in terms of accuracy. Although GT can handle straightforward and commonly used phrases well, the tool struggled when confronted with more complex or context-dependent content, another conclusion similar to the findings of Fuentes-Luque and Santamaría Urbieta (2020). This was the case of the error regarding the opening hours in Table 6, in which the future tense of the verb *to be* in ES to express a reiterative pattern of opening hours was translated literally into EN. DeepL did better, as it did not mimic the ES structure.

After using MT to render the ES content into EN and FR, we concluded that the MT-generated content had to be revised to ensure first-class quality standards. Human evaluation is still a valuable resource for assessing the quality of MT-generated output, as it provides the expertise necessary to identify and address linguistic nuances, ensuring that the final translations meet the desired standards of accuracy and fluency. Consider example 3 in Table 6, where GT translated a previously translated segment differently, without any apparent justification, or example 1 in Table 8, where DeepL's translation included words which did not exist in FR. Overall, our results align with those of the study conducted by Leiva Rojo (2020), where translations of English museum texts into Spanish were assessed. Although Leiva Rojo's study revealed that many of the official translations analysed were "very poor" and, in contrast, our study found acceptable official translations, both studies show that MT did not significantly improve their quality.

Thus, answering RQ2, when the goal is to provide high-quality, verified content, GT and DeepL can serve as complementary tools in the translation process. However, when a translation from scratch by a professional

translator is not feasible and machine translation is used instead, the involvement of professionals with high linguistic competence remains essential. Post-editing machine-translated content is necessary to ensure optimal content quality that is adapted to the readers' needs. Finally, it is important to note that the need for human intervention is not unique to the translation of tourist attraction websites. Other tourism-related texts translated using MT, such as those involving culturemes in gastronomic texts, also require human intervention to achieve high quality (Cuadrado Rey and Navarro Brotons, 2024).

CONCLUSIONS

Our study had three objectives: 1) to assess the linguistic quality of the websites of Spain's top 20 tourist attractions in Spanish and their official translations into English and French, 2) to analyse the quality of the machine-generated translations using GT and DeepL for these websites into EN and FR, and 3) to compare the quality of the official EN and FR versions with the GT and DeepL-generated translations into EN and FR.

Regarding the first objective, the first conclusion is that there is a clear need to improve both the original ES versions as well as the official localised EN and FR versions of the websites analysed. The analysis revealed a significant number of punctuation errors, typos and misspellings in the original ES versions of several websites. Such errors could potentially hinder the quality of translations produced by MT. A total of 37 errors were detected in the original ES versions. The official localised versions of the websites had 39 errors (EN) and 6 (FR), with mistranslations, spelling errors and spelling being some of the most usual errors. It is also important to note that 90% of the websites offered EN versions, but only 30% had FR versions. We believe, however, that many of the websites did not employ professional translators to proofread the original ES versions and translate their content into EN and FR.

Regarding the second objective, there was a noticeable difference in translation quality between GT and DeepL. DeepL (36 errors in EN, 10 in FR) outperformed GT (93 errors in EN, 19 in FR). GT often copied existing structures and errors from the Spanish versions of the websites, resulting in many errors categorised as "mistranslation" and "awkward" in the EN translations. In contrast, DeepL managed to correct some of these issues. For FR, a common problem for both MT tools was terminology, with GT frequently leaving text untranslated.

Thus, regarding the third objective, it was observed that the linguistic quality of the machine-generated translations was generally not better than the official localised versions. In fact, GT produced significantly worse translations both in EN and FR than those already published in the official

websites. The only exception was the EN translations by DeepL, which slightly surpassed the quality of the official localised websites for the EN language. In any case, the intervention of highly trained human translators is essential to provide tourists with thoroughly refined texts. This could potentially enhance their overall experience, given the significant role websites play in their tourism-related decision-making (López González, 2020).

Although this study has shed light on the linguistic quality of the websites of Spain's top tourist attractions and on the performance of GT and DeepL when translating them into EN and FR, it is also necessary to acknowledge its main limitation: the sample size. It should be expanded in future studies for a more comprehensive understanding of the quality of tourism-themed websites in Spanish and their localised versions, especially when comparing it to the output of MT tools such as GT or DeepL.

Future directions could focus on web accessibility, assessing whether the websites of Spain's top 20 tourist attractions meet basic accessibility criteria. Regarding the quality of the machine-translated content, the identified and categorised errors could be further classified into minor or major translation errors, depending on whether they hinder the understanding of what was conveyed in the original content in Spanish.

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