

Analyzing the Presentation of Multilingual User Reviews in Accommodation Websites

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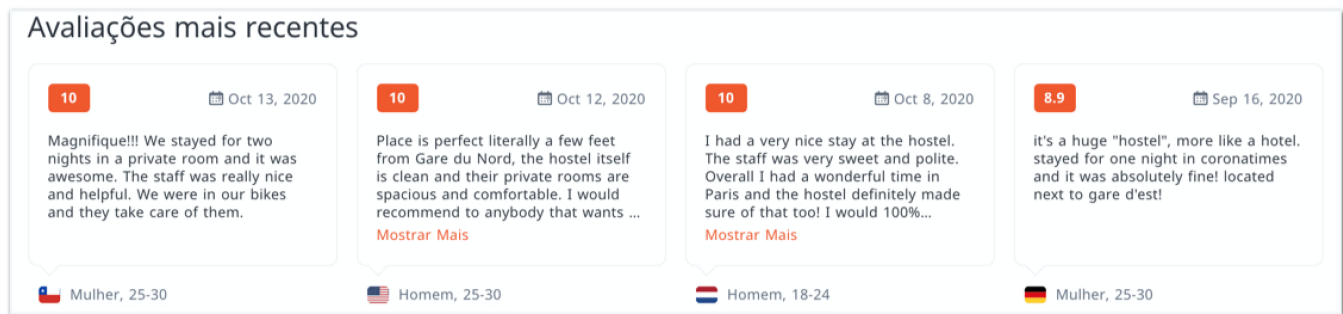


Figure 1: A hostel page in Hostelworld displays reviews from international users: all comments are in English, while the interface language is Brazilian Portuguese.

ABSTRACT

Presenting user reviews in multiple languages is an increasingly common practice among system developers and can be found in the majority of accommodation websites nowadays. Despite this growth in popularity, the design strategies used to collect and present these multilingual reviews in a clear and useful way are yet to be uncovered. In order to understand how current accommodation websites are presenting the reviews of their international users, we assessed four popular systems applying the Semiotic Inspection Method. Results and triangulation with a previous study show that the design strategies still present some discrepancies and communicability problems, but slowly start to converge to a common set of patterns. We hope the results can help to identify a pattern language and good practices for the design aimed at bilingual and plurilingual users.

CCS CONCEPTS

• Human-centered computing → Web-based interaction.

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KEYWORDS

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1 INTRODUCTION

The advent of the Web 2.0 in the early 2000's started a new phase for Internet and computing in general [11]. The power of user generated content was so significant for software systems that the Time Magazine elected "You" as the Person of the Year in 2006 [6]. It did not take long for software developers to realize that many of these users were able to understand and produce content in more than one language. Just one year later, Facebook announced its Translations application [9], one of the first large scale crowdsourced translation projects and a key tool for the translation of the social network into more than 160 languages, including many vulnerable and endangered tongues [14]. For the first time, engineers were taking advantage of a disregarded characteristic of technology users: the ability to communicate in multiple languages. As a matter of fact, available data indicate that there are more bilingual and plurilingual individuals in the world than there are monolingual [15].

Plurilingualism is the ability of a person who has competence in more than one language to switch between multiple languages depending on the situation for ease of communication [1]. Although similar to the concept of multilingualism, plurilingualism refers more to the interconnected knowledge of multiple languages. On the other hand, multilingualism is employed to situations and/or locations in which multiple languages exist side-by-side but are utilized separately [12]. Based on the assumption that most technology users nowadays are plurilinguals, the simultaneous presentation of content in different languages has been adopted in many popular websites, especially to display international user reviews. Like crowdsourced translation, user reviews also gained momentum with the emergence of Web 2.0 technologies and it has been a few years since multilingual reviews can be found in websites from different categories, such as E-commerce (eBay¹, Amazon²), Travel & Tourism (TripAdvisor³, Expedia⁴), and Accommodation & Hotels (Booking.com⁵, Airbnb⁶).

In recent years, it became commonplace for hotel clients to read other clients' reviews before booking an accommodation. See Fig. 1 for an example of a hostel booking website displaying comments written in English to a Portuguese speaking user. It has already been demonstrated that the amount and quality of reviews have great impact in the hotel business performance [16, 17]. Moreover, aspects on the presence of multilingual reviews in accommodation websites have been addressed in recent papers, such as the correlation between language and ratings [7, 10] and the influence of foreign-language reviews on customers' decisions [8]. Despite this growth in importance and popularity, the design strategies used to present these multilingual reviews in a way that is clear and useful for the users is still an unexplored research topic.

In order to understand how current accommodation websites are presenting the multilingual reviews from their users, we evaluated the presentation of user reviews in four popular websites, using the Semiotic Inspection Method. Subsequently, we analyzed and compared the results with a previous study on the same subject [3]. Finally, some patterns found during the analysis are discussed and might serve as a starting point for a pattern language or good practices catalog towards the design for plurilinguals.

This paper is composed of five sections including this Introduction. Section 2 describes the methodology used in the study. The main findings for each investigated website are presented in Section 3. In Section 4, results are discussed, compared and triangulated with the previous study yielding a small set of patterns. Finally, Section 5 presents final considerations and future work.

2 METHODOLOGY

Given that language usage and communication were the key aspects being evaluated in this study, an approach based on Semiotic Engineering was chosen. This theory treats human-computer interaction as a unique set of computer-mediated communications between the designer and the user [4]. In order to evaluate the

presentation of the multilingual reviews, we applied the Semiotic Inspection Method (SIM) [5]. This method is based on Semiotic Engineering theory and explores the large number of symbols to which the user is presented throughout the interaction with a computer system. Besides a preparation phase, SIM consists of five steps: (1) inspection of documentation and help content (meta-linguistic signs); (2) inspection of the static signs; (3) inspection of the dynamic signs; (4) comparison of the meta-communication of steps 1, 2, and 3; and (5) appreciation of the quality of the designer-user meta-communication. Fig. 2 shows a summary of the methodology including the SIM steps, which are repeated for each one of the analyzed systems.

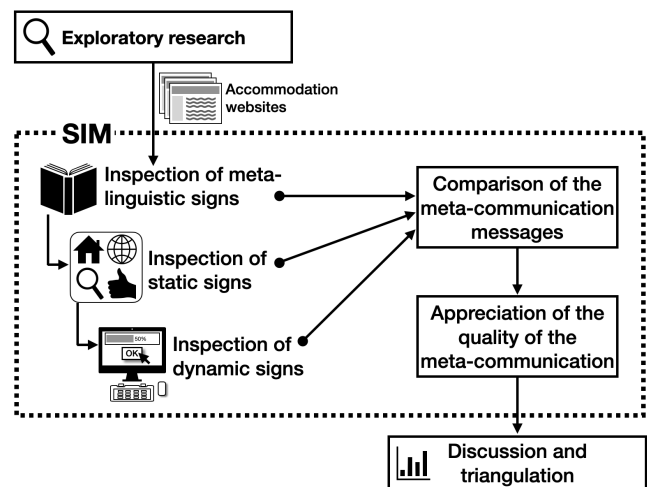


Figure 2: Summary of the methodology used in the study.

The first step of this study was to select four websites in the Accommodation and Hotels category. Based on the SimilarWeb ranking⁷, we chose Booking.com, Airbnb Brasil⁸ and Hoteis.com⁹ to be included in the list. These websites currently represent three of the top ten accommodation platforms on the Web (Airbnb Brasil and Hoteis.com are the Brazilian versions of the Airbnb and Hotels.com platforms respectively). The fourth chosen website was Hostelworld¹⁰, the leading platform in the hostel bookings niche. The Brazilian versions of the websites were chosen for two reasons that enriched the analysis: because Brazil is a non-English speaking country with an official language (Brazilian Portuguese) that is a dialect of an European language (European Portuguese).

All the websites were inspected during the first quarter of 2021, the same period in which the screenshots were taken. Each website was analyzed by two specialists and an online meeting was arranged to clarify inconsistencies, which were solved by consensus. After analyzing the meta-linguistic, static and dynamic signs, the meta-messages were compared and the meta-communication appreciated. Findings were then analyzed and triangulated with results from a previous work. Good practices found during the analysis were

¹<https://ebay.com>

²<https://www.amazon.com>

³<https://www.tripadvisor.com>

⁴<https://www.expedia.com>

⁵<https://www.booking.com>

⁶<https://www.airbnb.com>

⁷<https://www.similarweb.com/category/>

⁸<https://www.airbnb.com.br/>

⁹<https://www.hoteis.com/>

¹⁰<https://www.hostelworld.com/>

finally consolidated in a small set of patterns. Because of this early stage of development, we call them *pre-patterns* as proposed by Chung et al.: patterns that are still emerging and may not be in common use yet by the design community [2].

In order to evaluate how each website was dealing with user generated content in multiple languages, the inspection should cover functionalities such as presentation, filtering and sorting of multilingual reviews. Based on the nature of the websites, the following scenario was used by the specialists to inspect the interface: *A Brazilian tourist is looking for an accommodation to spend two nights in Paris. He is interested in reading hotel reviews including foreign language comments posted by international guests.*

3 RESULTS

After the stage of preparation and initial analysis, the websites were inspected and the results are presented in the following sections.

3.1 Booking.com

According to the SimilarWeb ranking, Booking.com is currently the most popular website in the Accommodation and Hotels category. It also occupies the first position in the broader category of Travel and Tourism. A single website serves customers from all countries and the user can change language and currency of the interface at any moment with a set of buttons at the top of all pages. Fig. 3 presents the most relevant signs found during the inspection.

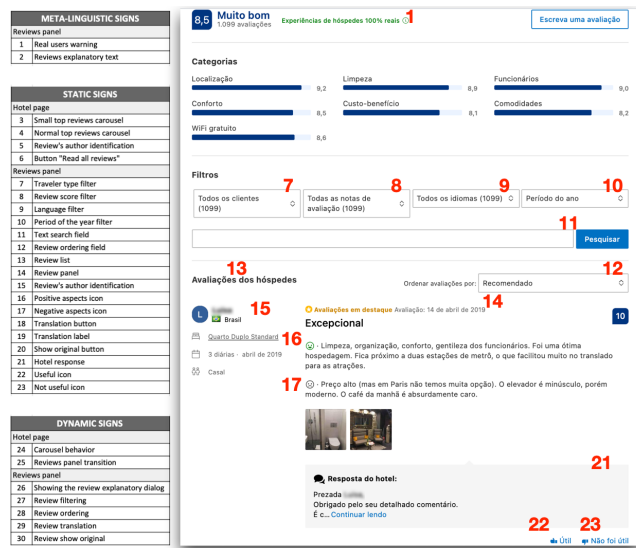


Figure 3: User reviews in Booking.com and a list of the most relevant signs.

We can see that the designers favor content in the interface language, while still offering functionalities for plurilingual visitors interested in international reviews. For example, a panel in the page of each hotel displays a summary with the 10 most recommended reviews under the label "What guests liked the most". The text of these reviews is presented three at a time in a carousel-like component and commentaries which are not written in the interface

language are automatically translated. A button with text "Read all the reviews" then leads the user to the larger reviews panel (Fig. 3). Brazilian Portuguese comments are presented at the top of the reviews list (Fig. 3-13) according to the recommendation algorithm that determines the default sorting (Fig. 3-12). However, the user can easily change this initial state by using either the review ordering control (Fig. 3-12) or the language filter (Fig. 3-9). The latter allows the user to select one language from a list, such that only reviews written in that language are displayed. The language filter worked particularly well, because the system seemed to identify the language in which the comment was written by analysing the text and not only relying on the interface language or on the nationality of the author. Overall, Booking.com attempts to keep a balance between providing multilingual content and keeping the website readable for monolingual users.

Some communicability problems were found in Booking.com, all of them induced by the usage of country flags to denote languages. Flags can be useful to represent countries or regions, but are usually considered ineffective or either offensive to denote languages [18]. This problem can be seen at the top of each page of the website, where a rounded flag indicates the current interface language. Flags also appear in the dialog used to select the interface language and in the language drop down list used to filter reviews in the reviews panel (Fig. 3-9). In this language filter, regional dialects such as Brazilian Portuguese are absent and the Portuguese language appears only once next to the flag of Portugal, which might cause confusion. It is also worth noting that, of all languages in the language selection dialog, only Taiwanese Mandarin appears without a corresponding flag, probably because the flag of Taiwan is considered offensive by Chinese government and citizens [18]. Finally, flags appear with another connotation next to the name of the reviews' authors identifying the user's country of origin (Fig. 3-15). Employing the same static sign for two different concepts may also cause confusion.

3.2 Hoteis.com

The website Hoteis.com is the Brazilian version of the Hotels.com platform maintained by the Expedia Group. According to the SimilarWeb ranking, Hotels.com is the sixth most popular website in the Accommodation and Hotels category. It is likely, however, that the platform would rank higher if considered all its international websites. The platform presents a different domain for each country and the different websites have small differences between them (the Brazilian version does not allow the user to change the currency, for example). Fig. 4 shows the most relevant signs found during the inspection.

Designers of Hoteis.com favor monolingual users and consider multilingual content of less importance. Looking at the website interface, the absence of some basic functionalities draws the attention. There are no options to filter the reviews by language, for example, only by the type of traveler (Fig. 4-7). Also, there is no way to automatically translate a review and the hosts cannot respond to customers comments. The recommendation system of the platform always positions reviews from Brazilians at the top of the list (Fig. 4-9), regardless of the language they were written in. This implies some communicability problems when combined

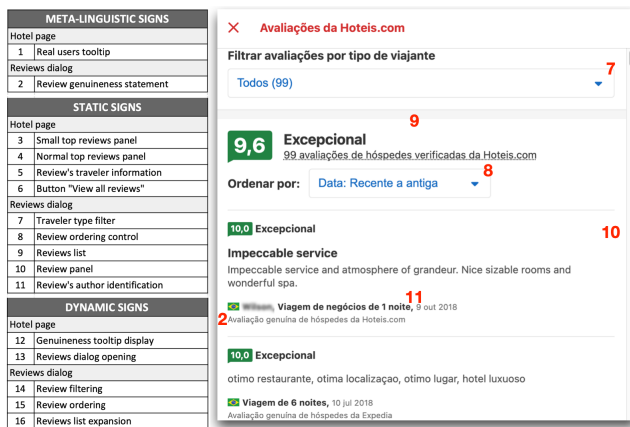


Figure 4: User reviews in Hoteis.com and a list of the most relevant signs.

with the sorting control (Fig. 4-8). The default ordering is “Date (from newest to oldest)”, but reviews from Brazilians are presented first even if there are international reviews more recent than the Brazilian ones. The same problem occurs when sorting by rating.

3.3 Hostelworld

Hostelworld was founded in 1999 and is the leading website in the hostel booking niche. One single version of the website is available for users in all countries. The users can choose at any time to change the interface language and currency. The main signs found during the semiotic inspection are presented in Fig. 5.



Figure 5: User reviews in Hostelworld and a list of the most relevant signs.

The designers of Hostelworld treat user language reviews and foreign language reviews at a similar level of importance. In the hostel pages, for example, a small list of four reviews, usually written in English, is presented to the user with the title “Most recent reviews” (see Fig. 1). At this summary panel, country flags are used

to identify the nationality of the review’s author. A panel containing the list of all reviews (Fig. 5) can be opened by clicking “View all commentaries”. Initially, only reviews from Brazilians are shown in the reviews panel, but the user can easily see all international reviews by choosing “All Reviews” in the language filter (Fig. 5-6).

At least three communicability problems were identified in Hostelworld. Firstly, despite the summary panel being entitled “Most recent reviews”, our inspection identified that it actually displays only the most recent reviews written in English. Reviews written in other languages, including the interface language (Brazilian Portuguese), were never included in this panel. Besides that, when the user clicks the “View all commentaries” button, the reviews panel (Fig. 5) is displayed with the language filter set to Brazilian reviews only (Fig. 5-6). This means that not all reviews are displayed by default (as it had been suggested by the button text). It was not uncommon for hostels with a small amount of reviews to open an empty list at this point because there were no comments written by Brazilians to be shown. Finally, the website does not make it clear in which language the reviews are written. In the summary panel, country flags are used to identify the author’s nationality (Fig. 1), something that not always identify the language, but serves as a useful aid. In the complete reviews list (Fig. 5-8), however, there is not any symbol identifying the authors’ country of origin (Fig. 5-10), something that could hinder the faster identification of the language in which the review is written.

3.4 Airbnb Brasil

Airbnb emerged in 2008 as one of the main representatives of the so-called *sharing economy*. Instead of focusing on hotel and hostel bookings, this website allows common people to announce temporarily vacant bedrooms or residences for rent. The platform is available through 61 different websites one for each of the supported languages/countries. According to the SimilarWeb ranking, Airbnb.com currently occupies the second position among the most popular accommodation websites while international versions of the platform occupy 9 positions among the top 20 of the Accommodation and Hotels category. The most relevant signs found during the semiotic inspection of the Brazilian version of the website can be seen in Fig. 6.

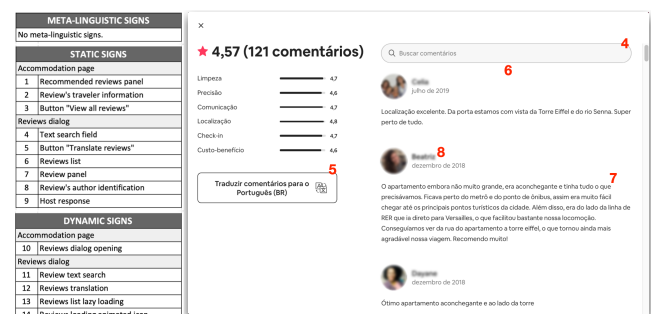


Figure 6: User reviews in Airbnb Brasil and a list of the most relevant signs.

The designers of Airbnb opted for a minimalist design style. The absence of any kind of filtering or sorting controls draws attention

(Fig. 6). The only way to find specific reviews is the text search field (Fig. 6-4). Even the rating given by each user to the accommodation is absent (Fig. 6-7) and only the overall rating is displayed, something unusual for this type of interface. The design team developed the interface thinking in monolingual users first while still offering functionalities for plurilinguals. The recommendation system, for example, always puts comments from compatriots at the top of the reviews list (Fig. 6-6). In addition to that, translation buttons are abundant all over the website (Fig. 6-5) allowing monolingual users to assimilate content in their own language. Foreign language reviews are still available to plurilinguals, even though the absence of language filters, sorting options and nationality icons (Fig. 6-8) might be some drawbacks that could hinder the plurilingual experience.

A potential communicability problem with the Airbnb interface is that the ordering criteria of the detailed reviews list is not clear to the user (Fig. 6-6). As stated before, the system apparently uses a recommendation algorithm and offers no ordering control, consequently making it difficult for users to understand the logic behind the sorting of the list. After analyzing three accommodations with more than 400 reviews, we identified the following criteria for the Airbnb reviews list classification: (1) comments from Brazilians written in Brazilian Portuguese; (2) comments from Portuguese people written in European Portuguese; (3) comments from Brazilians written in English; (4) comments from all other nationalities and languages. Within each of the four categories cited above, comments were organized in chronological order. A remarkable feature here is that the system would identify the language in which the review was written by analyzing the text and not simply relying on the interface language.

4 DISCUSSION

After applying the Semiotic Inspection Method in each one of the selected websites, findings were compared and triangulated with a previous study. Discussions on the good practices and communicability issues identified in the websites are presented in the following sections, followed by details of the triangulation. Finally, the most relevant good practices are presented in the format of three pre-patterns that might serve as a starting point for a pattern language towards multilingual user reviews interfaces.

4.1 Comparison and good practices

Negative and positive aspects of each interface may be elicited from a comparison between the websites. Table 1 shows a summary of the functionalities of each system, from which some good practices can be highlighted.

The presence of help content (or meta-linguistic signs) in three of the four systems is an aspect worth mentioning. Booking.com and Hostelworld include a text with guidelines for reading and writing reviews. The Booking.com guidelines contain explicit instructions for writing reviews to an international public, such as “*contributions must be appropriate for an international audience*” and “*avoid using profanity*”. Besides that, three websites use country flags to denote users’ nationality, something that can assist in the identification of the review’s language. All four websites favor reviews written in the user language: Hostelworld filters only reviews from compatriots

by default, while the other three websites use recommendation systems that position reviews written in the user’s language at the top of the list. Sorting reviews by date and rating was possible in all of the websites except Airbnb, and allowing the host to answer the reviews was also present in three of the analyzed systems. Other features are present in fewer websites but still deserve a mention: aggregation of reviews from other websites (Hoteis.com); automatic translation (Booking.com and Airbnb); and evaluation of reviews by the users (Booking.com).

4.2 Communicability issues

The websites also presented some communicability problems. Some of these issues were recurrent. In Hoteis.com and Airbnb Brasil, for example, the adoption of recommendation systems and the absence of proper filtering and sorting controls make it difficult to understand what is the logic behind the ordering of the reviews. In Hoteis.com, this problem is potentialized because the system considers only the nationality of the reviews’ author disregarding the language in which the review was written, the same problem of Hostelworld. In both systems it was common to see reviews written in English in places where the user would expect only comments in Portuguese. Not showing any indication of the nationality of the review’s author is an issue for Hostelworld (in the complete reviews list) and Airbnb Brasil. Finally, it was remarkable to find that only one website (Booking.com) includes a filtering option that allows users to select reviews of some specific language. For the other three websites, finding reviews in a particular language demands the user to navigate through the (sometimes very extensive) complete list of reviews. Hostelworld stands out with the highest number of communicability issues, mostly caused by incongruous static signs. Many problems found in Booking.com, in turn, stem from the usage of country flags to denote languages. Out of the four analyzed systems, this was the only one that presented this type of issue.

4.3 Triangulation with the previous study

Findings were triangulated with results from a previous study by Da Rosa and Pons [3]. These authors applied the same inspection method to five websites from diverse sectors, including Booking.com and Hostelworld. A comparison with the results from four years ago shows an evolution in Hostelworld. This system demonstrated many usability and instability problems in the previous research and now presents a more stable behavior despite some communicability issues. Booking.com, in turn, presents now simplified filters in comparison to its previous interface. In the past, users could choose a set of languages in which they wanted to see the reviews, and now the language filter allows the selection of only one language at a time. In general, the design approaches currently adopted by the websites seem more uniform in comparison to the previous results. All four websites inspected for this paper clearly prioritized users interested primarily in reviews written in their native language: Booking.com, Hoteis.com, and Airbnb Brasil all display reviews written in the user’s language at the top of the reviews list, while Hostelworld initially filters reviews to show only the ones from compatriots.

Feature	Booking.com	Hoteis.com	Hostelworld	Airbnb
Includes meta-linguistic signs	Yes (genuineness statement & guidelines)	Yes (genuineness statement)	Yes (genuineness statement & guidelines)	No
Identifies author's country	Yes, country flag and name	Yes, country flag	Yes (on the summary only)	No
Shows reviews from other sites	No	Yes, from partner site Expedia	No	No
Default ordering	Recommended (user language first)	Recommended (user language first)	Most recent (user language only)	Recommended (user language first)
Available ordering options	Recommended, date, rating	Date, rating	Date, rating, age group	None
Available filtering options	Type of traveler, rating, language, period of year	Type of traveler	Language (only in the user language or all)	None
Text search	Yes (exact match)	No	No	Yes (exact match)
Automatic translation	Yes	No	No	Yes (translate all reviews)
Allows host response	Yes	No	Yes	Yes
Users evaluate reviews	Yes (useful / not useful)	No	No	No

Table 1: Comparison of the websites' functionalities.

4.4 Pre-patterns of multilingual reviews

From the discussion in the previous sections, we propose a collection of pre-patterns for designing user reviews interfaces with multilingual content. While still in a very early stage, this small set of patterns might give rise to a more complete pattern language.

MULTILINGUAL REVIEWS GUIDELINES

Problem: the user wants to read multilingual reviews and/or contribute a review to the website but has no experience in interacting with multilingual content.

Solution: include a page in the website with instructions to novice readers/contributors. These guidelines should clarify issues regarding the language choices, review format, and ethical aspects. A link to this page should be included somewhere in the interface that displays the users' reviews, so that users can easily access the instructions. The guidelines for reading and writing reviews present in Booking.com and Hostelworld are an example implementation of this pattern.

DISPLAY AUTHOR'S NATIONALITY

Problem: the user is presented with many reviews in different languages. Struggling to identify the nationality and language of each review may hinder the reading experience.

Solution: display a country flag, country name, or both items close to the name of the review's author. Allowing other users to recognize the nationality of each review's author not only helps to identify the most probable language in which the review was written, but also provides important information on the cultural background of the author. Booking.com and Hoteis.com display information about the author's nationality in their reviews summary and list.

NATIVE LANGUAGE FIRST

Problem: users are interested in reviews from international guests, but tend to pay more attention to reviews written by their compatriots and/or in their native language.

Solution: be sure to present reviews written in the user's language at the first positions of the list, whenever such reviews are available. Using a recommendation system is a good option, so that reviews from compatriots and/or reviews written in the user's language can receive higher scores. In any case, it is recommended that the interface make it clear which are the sorting and filtering criteria being used to display the reviews list. Booking.com uses a recommendation system for sorting and makes it clear to its users.

5 CONCLUSION

Although consolidated among designers of hotel websites, the practice of presenting multilingual content on the Web still lack a deeper analysis from the human-computer interaction research community. This paper presented a semiotic inspection of four popular accommodation websites to elicit how these systems are presenting multilingual reviews and assess the communicability of the solutions. The evaluation, analysis and comparison of the four interfaces revealed some communicability problems, as well as common design strategies that could be the starting point for the identification of a pattern language for this type of system. A triangulation with a previous study showed refinements in one of the websites and greater uniformity between the systems.

Despite still being at an early stage, this study points to some interesting research opportunities for future work. In order to complement the semiotic inspection described here, experiments with final users could allow the evaluation of the solutions from another perspective. While the SIM enables the analysis of the message emission, applying a method such as the Communicability Evaluation Method (CEM) could elicit issues from the reception side [13]. Besides that, a deeper exploratory research and an assessment of more websites (including websites from other sectors) could make possible the identification of a pattern language for the presentation of multilingual user reviews in general. These studies might capture practice that is both good and significant, helping to better understand and describe this new way of building web interfaces which takes into account bilingual and plurilingual users.

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