

# Online booking platforms: Towards making more sustainable choices

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## ABSTRACT

Tourism has become an important contributor to many sustainability issues. In addition, online booking platforms have grown to become an increasingly used means of booking accommodation, which can be crucial for encouraging sustainability. Furthermore, the promotion of sustainable tourism (ST) and accommodation services at an international level has become essential. Although the number of sustainability-certified accommodation solutions has been increasing, limited attempts have been made to promote ST using online booking platforms. This study aims to identify whether the concept of sustainability has been integrated into online booking platforms. For the objective to be met, a representative sample of platforms were identified and then analysed both in terms of their content and by testing them. The results highlight that this concept has not been adequately integrated into such platforms and that the COVID-19 pandemic has shifted the priority from sustainability to health and safety issues. However, the opportunity to take advantage of the pandemic to promote ST is still possible.

## 1. Introduction

The tourism industry is among the fastest-growing economic sectors. The number of global tourism arrivals reached 1.5 billion in 2019, representing a 4% increase over 2018 (UNWTO, 2020). Nonetheless, after a promising year, such an undisrupted increase was compromised due to the COVID-19 pandemic that affected the entire globe. International tourist arrivals decreased by 83% during the first three months of 2021 (UNWTO, 2021). Given the intense growth of the industry until the pandemic outbreak and its likely recovery (Polyzos et al., 2021; Zhang et al., 2021), ever-increasing environmental (Manniche et al., 2018) as well as social and economic impacts (Tasci, 2017) have been found to be related to tourism activities. Therefore, a pandemic emergency should be perceived as an opportunity to promote sustainable tourism (ST) in the future (UN, 2020b; Sheller, 2021).

The United Nations (UN) have explicitly highlighted the promotion of ST through the Sustainable Development Goals (SDGs) (UN - United Nations, 2016). Indeed, some of the SDGs specifically refer to ST (UN - United Nations, 2016), such as: designing and implementing policies for the promotion of ST (objective 8.9); developing and implementing tools for monitoring sustainability impacts for ST (12.B) that create jobs and promote local culture and products; and increasing the economic benefits of developing countries via tourism (14.7). For the promotion of ST, the UN developed the Certification for Sustainable Tourism, a system for

achieving the integration of the main elements of ST, such as good management practices, environmental and social impacts of services, client's awareness of image, and correspondence between the service offered and the product's promotion (UN, 2020b). Moreover, when it comes to accommodation facilities, the European Commission developed the ecolabel scheme to promote sustainable accommodation services (European Commission, 2009, 2017), and the Global Sustainable Tourism Council released a set of specific criteria and indicators that need to be met in order to promote ST (GSTC, 2016). However, except for the Ecolabel scheme, such criteria and indicators were not specifically developed based on the concept of life cycle thinking (LCT).

Online booking platforms have become an increasingly popular means of booking accommodation in tourism (Cheyne et al., 2006; Dutta and Manaktola, 2009; Chaw and Tang, 2019; Koroleva and Vishnevskaya, 2020), making the effectiveness of easily interpreted information increasingly important (Vinzenc, 2019). This article builds upon previous work (Raggi et al., 2018; Arzoumanidis et al., 2018, 2020), and it is part of a larger EU-funded project. This ongoing project aims to develop a set of life cycle-based sustainability indicators to be used as filters in online platforms to help users make more sustainable choices, thus promoting sustainable and circular tourism (CT) systems. This article focuses on a preliminary objective of the project to identify whether the concept of sustainability has been integrated within online booking platforms. The remainder of this paper is structured as follows: In

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Section 2, a theoretical background is provided; Section 3 describes the methods used to achieve the objectives of this study; Section 4 describes and discusses the results; and Section 5 presents the conclusions of the study.

## 2. Theoretical background

The scientific literature addressing the objective of the study is limited (Raggi et al., 2018; Ertaş, 2018). Arzoumanidis et al. (2018) provided a definition of ST and its importance for online booking platforms and tour operators. Supply chain management (Schwartz et al., 2008; Sigala, 2008; Hamid and Isa, 2017) and corporate social responsibility (Dutta and Manaktola, 2009; Hamid and Isa, 2017) have been identified as drivers for the promotion of ST. Owners and managers of accommodation facilities must realise their potential to promote sustainability (Schwartz et al., 2008; Dutta and Manaktola, 2009) as well as the potential of their supply chain, i.e., their external contractors or suppliers (Sigala, 2008).

As previously mentioned, online booking platforms are currently one of the most commonly used means of booking accommodations in tourism (Dutta and Manaktola, 2009). Furthermore, human behaviour is a driver of most sustainability challenges (Baddeley and Font, 2011), and it could be used and guided into making the right choices (Cheyne et al., 2006; Chaw and Tang, 2019; Pop et al., 2021). For example, when selecting an environmentally friendly hotel through the interface of an online booking platform. However, the selection of sustainable accommodation could also depend on socio-demographic factors or be unintentional or incidental (Ponnareddy et al., 2017; Tasci, 2017). The importance of a guided choice towards ST via appropriate communication and/or ecological cues (Ponnareddy et al., 2020; Tanford et al., 2020) or via customer review schemes (Nicoli and Papadopoulou, 2017) on such platforms has also been highlighted. However, it should be noted that too much information can have opposite effects on the users of the platform, as they will tend to focus on typical information and ignore environmental initiatives (Babakhani et al., 2020).

However, the number of sustainability-certified accommodation solutions have increased (Font et al., 2017) and the concept of sustainability has been discussed by some platform operators (e.g., Trivago, 2019, Booking Holdings, 2021) only indirectly, i.e., not on their main websites, where the accommodation research engine is located. Moreover, limited attempts have been made to promote ST by individual online booking platforms designed to promote “green” accommodation, such as Eco B&B (Ecobnb, 2020) and sustainable destinations such as Green Destinations (Green Destinations, 2020). In Eco B&B, the main criteria and indicators for sustainability include 100% renewable energy, organic and local food, car-free accessibility, ecological cleaning products, more than 80% waste recycling, green buildings, energy-saving lights, solar thermal panels for hot water, water flow reducers, and recovery and reuse of rainwater (Ecobnb, 2020), thus promoting ST and, in some cases, CT. The Green Hotels Association has also adopted similar indicators (e.g., water and energy) (Green Hotels, 2020). Notably, in most such cases, only the environmental pillar of sustainability is taken into consideration and promoted. On the other hand, when it comes to destinations, Green Destinations (2020) promote ideas that include all three pillars of sustainability by supporting local culture and tradition; involving the local business and improving local community employment; protecting scenic views, landscapes, natural habitats, and wildlife; and preventing overtourism. However, these remain niche websites that still require users, primarily environmentally sensitive users, to specifically know about them (or have looked for them).

## 3. Methods

To meet the objectives of this study, a set of online booking platforms were selected and tested to identify whether and how they have started

to incorporate the concept of sustainability. The authors performed testing by simulating an accommodation booking following specific criteria and during three different periods of time, as detailed below. Fig. 1 is a graphic representation of the methodology design.

The selection of the platforms was based on the hypothesis that the number of visits to such platforms is related to the number of overnight trips, given that a person needs to book accommodation before leaving for an overnight trip (Arzoumanidis et al., 2018). Therefore, overnight in-country trips (domestic tourism) were added to the number of trips to other countries (outbound tourism) in 2016, and this total was used to rank the countries with the most overnight trips. The required data for such calculations (number of trips) were obtained from the UNWTO (2018); only in a limited number of cases, where such data were not available in the UNWTO (2018), the data were complemented by other sources, for example, OECD (2018), Trading Economics (2021), BMWi - Federal Ministry for Economic Affairs and Energy of Germany (2017), The Straits Times (2017), and Malay Mail (2017). Table 1 presents a list of 40 countries with the most trips. Finally, countries that cumulatively accounted for more than 80% of the total number of trips were considered for the analysis.

After the sampled countries were identified, an online marketing search engine was used (Semrush, 2021). Such an engine provides for a given country the number of visits by users during a given timeframe for a selected platform as well as for its competitors in decreasing order. In this way, the research was performed for the number of visits to the various online booking platforms and for all countries that were identified with respect to the previously mentioned 80% threshold. It should be noted that China was identified as a limitation here because no data was available for this country on the online marketing search engine. Therefore, this country was replaced by the next one in the order of the countries in Table 1, while maintaining the set threshold (i.e., France). The same threshold was used also for the identification of the platforms (they were selected in order of visits including the last platform that its number of visits when added to all previous ones surpassed 80% of the total number of visits). This process led to the selection of eight websites: TripAdvisor (2021), Kayak (2021), Trivago (2021), ClearTrip (2021), Booking (2021), Expedia (2021), Hotels (2021), and MakeMyTrip (2021). These websites were assigned a random code from A to H in order to ensure the anonymity of the results and they are here presented in random order. Among them, three websites are multi-online booking platform engines, i.e., they check for accommodation possibilities on a set of other booking platforms.

In addition, the analysis of the online platforms was carried out not only in terms of the platforms themselves, but also of their sustainability-related issues on the web using the Google search engine. The analysis of the platforms was performed by visiting the identified websites<sup>1</sup> and examining whether (i) the website provides information on (how to select a) sustainable accommodation (e.g. directly on its home page or on other sections by means of a qualitative analysis of the textual content), and (ii) whether the accommodation search engine provides filters for selecting sustainable properties (when performing a booking simulation) in the same way it would provide those for star rating, facilities, property type, or other features. To enhance the robustness of the results and examine the trend of the inclusion of sustainability, the overall procedure was repeated three times (September 2017, February 2019, and September 2020) for different destinations and for different booking time intervals and seasons (April, August, and December). In this way, different types of destinations were selected, covering various continents and reflecting solutions for different

<sup>1</sup> For all websites, the .com domain was selected as the first choice. When this was not possible, the country code top-level domain for Italy (as the country where the PC was located) and the UK were selected, and the analysis procedure was repeated in order to exclude any eventual differences in the results presentation.

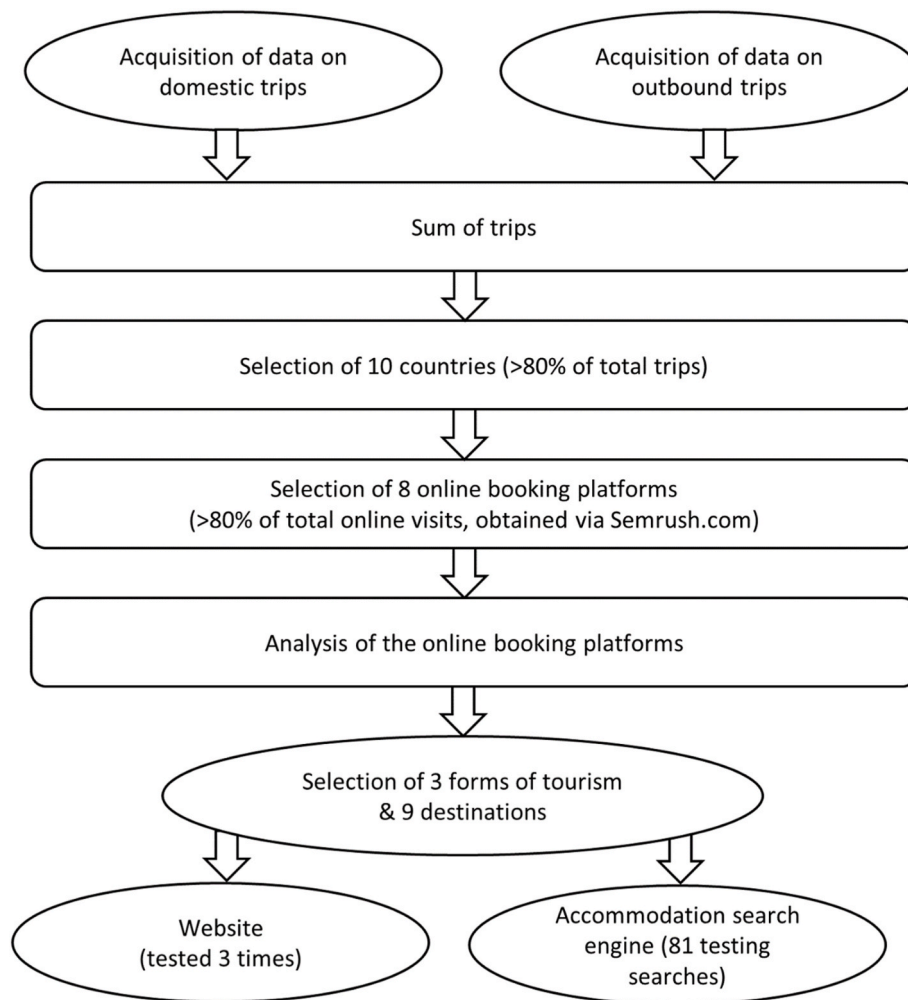


Fig. 1. Methodology design.

Table 1

List of countries (first 40) with the most domestic and outbound trips for 2016 (the selected countries are in bold).

Country	No of trips	Country	No of trips
1 China	4,570,130,000	21 Hong Kong (China)	91,758,000
2 <b>United States of America</b>	2,385,581,000	22 Switzerland	88,198,000
3 <b>United Kingdom</b>	2,024,470,000	23 Saudi Arabia	82,485,000
4 <b>India</b>	1,635,423,000	24 Russian Federation	79,874,000
5 <b>Japan</b>	658,195,000	25 Argentina	74,533,000
6 <b>Spain</b>	415,411,000	26 Vietnam	62,000,000
7 <b>Canada</b>	372,294,000	27 Romania	56,881,000
8 <b>Philippines</b>	320,542,000	28 Chile	53,026,000
9 <b>Australia</b>	290,295,000	29 Denmark	50,987,000
10 <b>Germany</b>	287,202,000	30 Poland	44,500,000
11 <b>France</b>	285,134,000	31 South Africa	29,851,000
12 Malaysia	265,778,000	32 Ukraine	25,226,000
13 Korea	264,133,000	33 Hungary	18,895,000
14 Taiwan	204,965,000	34 Lithuania	18,367,000
15 Mexico	187,246,000	35 Kazakhstan	18,221,000
16 Italy	187,207,000	36 Venezuela	17,194,000
17 Turkey	114,393,000	37 Norway	15,733,000
18 Peru	112,095,000	38 Nigeria	14,787,000
19 Colombia	104,756,000	39 Latvia	14,136,000
20 Czechia	95,862,000	40 Georgia	12,960,000

cultural (Rome, Italy; Athens, Greece; Cairo, Egypt), summer (Santorini, Greece; Ibiza, Spain; Turks and Caicos, United Kingdom), and winter (St. Moritz, Switzerland; Rovaniemi, Finland; Harbin, China<sup>2</sup>) tourism, thus resulting in 81 testing searches for (ii). The website itself (i) was, on a whole, tested three times (2017, 2019, and 2020).

#### 4. Results and discussion

The qualitative analysis of the textual content on the home pages of platforms showed that only one of them (A) explicitly cited the possibility of sustainable or ‘green’ hotel booking. Furthermore, a specific programme ‘green leaders’, that aims to promote ‘eco-friendly’ facilities was mentioned. The platform then introduced a labelling system according to which a green leaf would indicate an accommodation facility with specific characteristics or practices, such as linen and towel reuse, recycling, and solar panels.

In terms of the accommodation search engine, the results (please refer to Table 2) showed that five out of eight platforms did not include a filter in order to directly search for a sustainable or green accommodation solution. In addition, two of the platforms (A and E) that used to have a specific filter in 2017 and 2019, respectively, removed them in 2020, and one of them included some general information on the

<sup>2</sup> Although China was excluded from the selection of platforms, it was included in the analysis based on its importance for the number of trips (Table 1) and for its winter destination, Harbin.

**Table 2**

Presence of filters for the research engine or labels in the resulting list that indicate a sustainable accommodation and presence of COVID-19 information.

Online Booking Platform	Filter			Sustainability Labels			COVID-19
	2017	2019	2020	2017	2019	2020	2020
A	Yes	Yes (not immediate)	No	Yes	Yes	No	General info
B	No	No	No	Yes	Yes	No	General info
C	No	No	No	No	No	No	No
D	No	No	No	No	No	No	No
E	Yes	Yes	No	No	No	No	No
F	Yes (not immediate)	Yes (not immediate)	Yes (not immediate)	No	No	No	No
G	No	No	No	No	No	No	Certified hygienic properties
H	No	No	No	No	No	No	No

COVID-19 emergency. Only one website (F) maintained such a filter throughout these years, although it was not easily visible: indeed, the filter was not included in the default ones, but it could be created using the option of “more filters”. Regarding the presence of labels in the resulting list of search engine accommodations, it was found that two platforms (A and B) used indicators or labels to check if the hotel or facility was taking sustainability-related measures. Nonetheless, both platforms removed this option in 2020. However, in both cases, information on COVID-19 has emerged.

Regarding the two platforms that included a filter in order to search directly for sustainable or green accommodation (for the years 2017 and 2019), a calculation was carried out to identify the percentage of accommodation claiming to be sustainable or “green” for the year 2019. The results, which are summarised in Table 3, showed that for all three types of tourism and all nine destinations that were analysed, such a percentage remained significantly low (varying from 0 to 6.66%), with most of the cases being below 1% (on average 0.62% for A and 1.35% for E). This demonstrated a lack of willingness on behalf of accommodation owners to make their facilities more sustainable and/or to advertise such initiatives on the booking platform for the users to see.

These findings are consistent with the results of previous studies. Indeed, Ertaş (2018) analysed the environmental content on the websites of green hotels and reported that, in general, environmental messages on the websites of the companies remained at a very low level. Furthermore, the willingness of accommodation owners to include such information is related more to an eventual economic profit (advertisement/image enhancement) than to making tourism sustainable. Similarly, Hsieh (2012) reported a trend of low-level sustainability or environmental information on booking websites. Many hotel websites tend to include information on sustainability policies and practices (ibid.). However, this limits the user’s opportunity to learn about such initiatives only on the hotel’s webpage and not on increasingly and commonly used booking platforms.

According to a recent study, even though most tourists and accommodation clients are aware of the sustainability options in hotels, they would ignore them as they would not understand their functions or would choose them if they were not expensive (Szijártó and Valkó,

**Table 3**

Percentage of sustainable accommodation for various forms of tourism and destinations (reference year 2019).

	Cities	Online Booking Platforms	
		A	E
Cultural Tourism	Rome, Italy	0.44%	0.59%
	Athens, Greece	0.73%	0.28%
	Cairo, Egypt	0%	0.62%
Summer Tourism	Santorini, Greece	0.58%	0.6%
	Ibiza, Spain	0.3%	3.43%
	Turks and Caicos, United Kingdom	1.8%	N/A
Winter Tourism	St Moritz, Switzerland	1.69%	6.66%
	Rovaniemi, Finland	0%	0%
	Harbin, China	0%	N/A

2020). As mentioned before, the effects of the COVID-19 pandemic on the tourism industry and the possibility of sustainable recovery have been discussed (e.g., Moreno-Luna et al., 2021; Zhang et al., 2021). This research, however, demonstrated signs of another aspect of the relationship between the pandemic and sustainability: the pandemic shifted the priority from sustainability towards health and safety issues when it comes to online booking platforms. It goes without saying that given tourists’ attitude towards sustainability issues and the increasing use of online platforms for booking, the shift from sustainability to health and safety issues could eventually become an important obstacle for the promotion of sustainability in the sector.

Selecting a more environmentally friendly or so-called “green” hotel through the interface of an online booking platform can make an important difference from a societal point of view towards tourism sustainability. Furthermore, such a possibility of choice would encourage more active consumer involvement. A social assessment of these aspects, along with the environmental and economic aspects, could move in that direction. The challenges for the definition of sustainability strategies include the efforts of online booking platforms. Indeed, the inclusion of the concept of sustainability would require the use the LCT tools (ISO, 2000; 2006a; 2006b; UNEP & SETAC, 2009), with a strong interdisciplinary approach that requires technical-engineering and economic-managerial skills for a single accommodation to identify its environmental, social, and economic performance and then display it in terms of indicators (under filters/labels).

**5. Conclusions**

The tourism industry has been identified as one of the fastest-growing economic sectors, even though such an undisrupted increase has been compromised by the COVID-19 pandemic. This article is part of an EU-funded project and aims to identify whether the concept of sustainability has so far been integrated into online booking platforms.

The results highlight that the concept of sustainability has not been adequately integrated into such platforms and that the COVID-19 pandemic has shifted the priority from sustainability to health and safety issues. Furthermore, eventual clients of accommodation services may seem to be somewhat confused with existing sustainability filters and labels, as well as unwilling to pay more for a more sustainable option. However, as aforementioned, the opportunity to be grasped out of the pandemic to move towards sustainability in tourism is still there, and online booking platforms can play an important role towards that.

This study has some limitations. Indeed, China was not included in the analysis of the websites because data for this country was unavailable on the online marketing search engine. However, the country was included as a destination in the website testing stage given its importance based on the number of trips made and having a notable winter destination. Furthermore, even if a representative number of platforms were analysed, this was still a limited number. Along with potentially dealing with these limitations, future developments of this project will include the identification of life-cycle-based sustainability and circularity indicators that could be used as filters in such platforms in order to help users make more sustainable choices, thus promoting ST and CT

systems.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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