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Tourist interaction and satisfaction with chatbot interfaces on pre-visit destination image formation? A case study

Abstract

In recent years, intelligent chatbot systems have been expanded and applied in various fields yielding great advantages for the tourism industry, facilitating the technological evolution of destinations. However, understanding of individuals' interactions with chatbots during trip planning has not yet been examined. Based on the theoretical attributes of smart tourism technologies, that is informativeness, empathy and accessibility, this study identifies the attributes of chatbots that generate tourists' satisfaction and influence tourists' pre-visit destination image formation. The research conducted a laboratory experiment and a survey on potential tourists. Statistical tools such as confirmatory factor analysis were employed to confirm reliability and validity, and a covariance-based structural equation modeling test with maximum likelihood estimation was performed to identify the relationships among the constructs. The results show that informativeness is the main attribute that influences users´ satisfaction and, in turn, destination image formation. This study contributes to the extant literature by identifying the influence of certain chatbot attributes in creating destination image (DI) through a mediation model. Moreover, the study has managerial implications and provides DMOs with practical insights for the creation of destination chatbots in order to improve tourists' destination image formation.

Key words: Chatbot, informativeness, empathy, accessibility, destination image, tourist satisfaction.

Introduction

Smart Tourist Technologies (STTs) are technological agents that can enhance tourists' experiences as well as generate added values at destinations (Neuhofer, B., Buhalis, D., & Ladkin, 2015). However, some of them cause disruption in the tourism industry (Sigala, 2017), while others show limitations regarding accessibility, ease of use or interactivity, among others. Therefore, it is important for destinations to identify and apply technologies that provide the information that tourists need in a personalized manner to create unique experiences (Boes, 2015; Buhalis, D., & Amaranggana, 2013), satisfaction, and in turn, influence the formation of a positive destination image. Satisfactory tourism experiences have been shown to have a positive influence on destination image (Kim, K., Hallab, Z., & Kim, 2012; J. H. Kim, 2014).

The recent literature on tourism and technology has shown that search engines, STTs and social media influence tourists' behavior during trip planning (Huang, Goo, Nam, & Yoo, 2017; Xiang, Z., Magnini, V. P., & Fesenmaier, 2015). Nowadays, emerging channels and platforms are disrupting the value structure of travel and tourism (Gretzel, U., Werthner, H., Koo, C., & Lamsfus, 2015; Xiang, Z., & Fesenmaier, 2017). For example, the adoption of dialogue systems such as chatbots continues to gain momentum in the tourism industry due to the high flow of communication that the tourist needs with the information services of the destination and with tourism service providers (Calvaresi, D., Ibrahim, A., Calbimonte, J. P., Schegg, R., Fragniere, E., & Schumacher, 2021). Chatbots are software programs that allow communicating with people in natural language (Shawar & Atwell, 2007), both in the form of text or voice, so users feel that they are conversing with human agents and not machines (Allison, 2012; Chaves & Gerosa, 2019; Shawar,

B. A., & Atwell, 2002). Chatbots can answer tourists' questions about the attractions they can visit at a destination (Sano, A. V. D., Imanuel, T. D., Calista, M. I., Nindito, H., & Condrobimo, 2018) or provide tourists with recommendations about hotels (Nica, Tazl, & Wotawa, 2018).

Pre-trip travel planning is an essential component in the travel experience (Eletxigerra, Barrutia, & Echebarria, 2021). In this stage, projected destination image and pre-travel experiences are important for tourists, especially since the emergence of Covid-19, which has limited mobility and has led to tourist experiences being lived from a distance (Gretzel et al., 2020). Tourists need to glean a substantial amount of information to develop their travel plans. Tourists require digital platforms and STTs that provide them with the information they need during the pre-travel process, when booking transport, flights and accommodation (Prebensen, Woo, & Uysal, 2014).

To date, the tourism literature has examined the pre-travel stage focusing on co-creation (Eletxigerra et al., 2021), motivations for traveling (Yoon & Uysal, 2005), and decision-making processes (Xiang, Z., & Gretzel, 2010). However, the use of chatbots in pre-trip travel planning and their influence on the formation of the destination image during this phase has not yet been analyzed. Consequently, empirical investigations into tourists' satisfaction with chatbots and the construction of tourism destination image becomes relevant.

In this study, to analyze the effectiveness of chatbots in the pre-trip stage, three essential attributes of STTs have been considered: informativeness, empathy and accessibility (No & Kim, 2015; Zhou, Gao, Li, & Shum, 2020). Informativeness is the ability of the chatbot to offer relevant, reliable and quality information in response to tourists' requests (Li & Mao, 2015); while empathy is the ability to identify the emotions of users and respond accordingly (Zhou et al., 2020). Accessibility is the ease of use of and access to the

services or contents of the chatbot (No & Kim, 2015). Therefore, this study aims to investigate which of these attributes of chatbots generate tourists' satisfaction and influence destination image formation in a pre-travel stage.

Literature review

Satisfaction and Destination Image (DI)

DI is the sum of beliefs, ideas and impressions that a person has about a destination (Crompton, 1979). Because DI has a positive influence on tourists' visiting intentions (Kim et al., 2014), tourist destinations strategically manage their communications to generate a positive image (Morgan, Pritchard, & Piggott, 2003).

DI can be formed before, during and after the trip, but the formation of DI in the pre-trip phase greatly influences tourists' decisions about the destination and the trip. According to Jani and Hwang (2011), tourists use different functional (tangible) attributes to form images during pre-trip stages and psychological (intangible) aspects in post-trip stages. Therefore, DI is created differently at the various stages of the journey. Consequently, this paper analyzes the tourist destination image created from the use of chatbots during the pre-trip stage.

Previous studies have shown that new technologies influence and generate DI (Gretzel, Sigala, Xiang, & Koo, 2015; Marine-Roig, 2019). For example, online platforms (Lam, Ismail, & Lee, 2020; Molinillo, S., Liébana-Cabanillas, F., Anaya-Sánchez, R., & Buhalis, 2018), travel blogs (Peralta, 2019), virtual reality systems (Yung et al., 2021) co-create experiences and also cognitive and affective images of destinations (Lam et al., 2020). The Internet has a significant impact on the construction of travel destination image through the multimedia content generated by DMOs but also through User Generated Content. (Xia, Zhang, & Zhang, 2018). Even videos shared by other users influence the image and decisions of tourists in the pre-trip phase (Zhou, 2014). However,

Frias et al. (2008) showed that tourist information search on digital platforms also has drawbacks for tourists, such as the large amount of information that tourists have to select, filter and evaluate since often, much of the information on the Internet is irrelevant to tourists' interests.

Chatbots are STTs that can interact with users, recognize their emotions and provide them with the information they need in a personalized way at any time (Leahu, L., & Sengers, 2014) thus saving the time required for generic searches in digital platforms and information selection. For example, content concerning the attractions of a destination provides tourists with information about what they can expect to see at the destination, as well as generating emotional behaviors. Therefore, chatbots in pre-trip stages increase tourist satisfaction in the search for information and contribute to the creation of DI. Thus, chatbots are acknowledged to generate previous experiences of destinations (Tussyadiah, 2020), provide attractive brand relationships and tourist satisfaction (Chung et al., 2018).

User satisfaction with a chatbot is positively associated with use continuance intention in online travel agencies (Li et al., 2021), and smartphone banking (Susanto, Chang, & Ha, 2016). The chatbot ordering method in quick-service restaurants leads to greater customer satisfaction and evokes better cognitive attitudes (Leung, X. Y., & Wen, 2020). Jiménez-Barreto et al. (2021), in the field of hospitality and tourism, analyzed customer motivational experiences with chatbots, and demonstrated that self-determination and customer experience constructs have direct effects on satisfaction. Personalized chatbot interactions increase emotion and rapport, and subsequently consumer purchase intention and satisfaction (Sands, Ferraro, Campbell, & Tsao, 2020). In user interactions with chatbot interfaces, perceived autonomy and perceived competence have a significant effect on performance and system satisfaction (Nguyen, Sidorova, & Torres, 2021). However, chatbots can also strengthen or destroy customer satisfaction and loyalty

(Calvaresi, D., Ibrahim, A., Calbimonte, J. P., Schegg, R., Fragniere, E., & Schumacher, 2021) due to AI service failures, which can negatively affect both customer satisfaction and the organization's reputation (Kim & Christodoulidou, 2013).

In the field of tourist destinations, in this study we propose that tourist satisfaction with chatbots can influence destination image formation. Therefore, we hypothesize that:

H1: User satisfaction with chatbots will positively influence destination image formation.

Chatbot attributes that influence satisfactory tourist experiences and positive DI formation

Informativeness

The quality of information provided by information and communication technologies (ICT) constitutes a fundamental aspect to satisfying the needs of tourists and consequently generate satisfactory tourist experiences (Wang, K., & Lin, 2012). Informativeness is the extent to which users perceive virtual agents as being capable of providing relevant information effectively (Li & Mao, 2015). It refers to a synergy between the quality and trustworthiness of the information provided by STTs in tourist destinations (Huang et al., 2017; No & Kim, 2015).

The reliability of information has been shown to be a key factor in predicting the value of social media in the search by tourists for information (Chung & Koo, 2015). Tourists consider that informativeness is the most significant factor in the use of technologies, since by generating enough information it allows travelers to choose the best option from among the alternatives (Lee et al., 2018). In the same line, the quality of the information provided by a tourism website has been shown to be a decisive factor in the behavior of tourists in their selection of a destination in the pre-trip phase (Chung et al., 2015).

In the context of chatbots, it has also been shown that providing reliable information to users is considered essential (Chung & Park, 2019). A recent study found that informativeness positively and significantly influences the quality of chatbot responses (Jiang & Ahuja, 2020). Other research based on a chatbot customer service reveals that information quality positively influences consumer satisfaction (Ashfaq, Yun, Yu, & Loureiro, 2020). Thus, it is crucial for chatbots to continue improving the quality of information they provide to tourists, as obtaining valuable information about the destination will significantly help in travel planning and destination selection. Therefore, informativeness will continue to be a major challenge in the future exploration of chatbots. (Tam, 2020). Therefore, we hypothesize that:

H2: Informativeness positively influences satisfaction with chatbot usage
H3. Informativeness positively influences destination image formation.

Empathy

Empathy has been studied in the field of hospitality (Cardone & Fu, 2019) and tourism (Kaneko, 2019; Tucker, 2016); especially in volunteer tourism (Butler & Tomazos, 2011), medical tourism (Rad, Som, & Zainuddin, 2010), sports tourism (Costa & Glinia, 2003), and dark tourism (Miles, 2002; Stone, 2006). Empathy is one of the five most important components of service quality that lead to customer satisfaction (Parasuraman, Zeithaml, & Berry, 1994).

Psychological studies reveal that empathy is a two dimensional construct (Vossen, Piotrowski, & Valkenburg, 2015): Cognitive empathy as the comprehension of another person's emotions (Vossen et al., 2015) and Affective empathy as the vicarious emotional response to the perceived emotion of others (Mehrabian & Epstein, 1972). In the field of technology, empathy is the humanoid ability to identify, understand and react to others' thoughts, feelings, behaviors and experiences (Murray, Elms, & Curran, 2019). In the

case of chatbots, Hu et al. (2018) defined empathy as an affective mode of understanding that involves emotional resonance. Technological agents with the ability to show empathy and social-emotional behavior have been seen to generate greater user trust (Leite, 2014). Similarly, Zhou et al. (2020) stated that social chatbots must have IQ (functional skills), and EQ (empathy and social skills) to gain the trust of users. For example, a robotic or virtual agent with that behaves empathetically is perceived by the user as friendlier (Paiva, Leite, Boukricha, & Wachsmuth, 2017). Moreover, an emphatic computer agent creates a more positive perception of the interaction (Prendinger & Ishizuka, 2005), and the display of empathetic emotional expressions enhances the user experience (Partala & Surakka, 2004).

Some studies have focused on understanding the effects of empathy and the emotions generated in human-chatbot communication (Alam, Danieli, & Riccardi, 2018; Ho, Hancock, & Miner, 2018; Portela & Granell-Canut, 2017). A chatbot using an empathetic tone has been shown to have significant effects on user satisfaction and reduce negative emotions such as anxiety, frustration, and sadness (Hu et al., 2018). Even agents that respond with empathy reduce user stress and generate more engagement (Brave, Nass, & Hutchinson, 2005). Therefore, chatbots should show a minimal level of empathy to strengthen the engagement and relationship between the user and the chatbot (Zumstein, D., & Hundertmark, 2017).

Chatbots displaying empathy are able to identify the emotions of users from conversational sessions, detect their evolution over time and thus understand the emotional needs of users (Zhou et al., 2020). However, there are still significant challenges to improve and increase chatbot empathy, as advances in artificial intelligence (AI), affective computing, and social computing are still in their early stages.

Therefore, we hypothesize that:

H4. Empathy positively influences satisfaction with chatbot usage

H5. Empathy positively influences destination image formation.

Accessibility

Accessibility is the ease with which a tourist can access the source of information during the trip using a digital technology system such as Internet or mobile applications (No & Kim, 2015). The existing literature has analyzed the accessibility of tourist websites (Mills, J. E., & Morrison, 2003), social media and blogs (Lee, 2010) and other tourism technology platforms (Buhalis, D., & Amaranggana, 2013; Buonincontri, P., & Micera, 2016); and has shown their importance in the generation of satisfactory tourist experiences (Jeong, M., & Shin, 2020).

Because of their accessibility, chatbots can facilitate various business processes related to customer services and personalization (Przegalinska, Ciechanowski, Stroz, Gloor, & Mazurek, 2019), in the medical industry (Siangchin & Samanchuen, 2019) for instance, or even to help diagnose COVID-19 (Martin et al., 2020).

Accessibility to digital agents improves usability (Torres, Franklin, & Martins, 2018) and is an essential factor for the joint creation of tourist experiences (Buhalis, D., & Amaranggana, 2013). It is the most influential attribute in the tourist's experience with technologies (Pai, Liu, Kang, & Dai, 2020) and is a key factor in user satisfaction (Lee et al., 2018). However, in a study by Jeong and Shin (2020), accessibility was not found to be a primary factor for tourists to maximize a memorable experience at the destination.

However, developments in accessibility for software and applications are not enjoying major technological advances (Torres et al., 2018). This means that achieving high-level accessibility is by no means an easy task. Tourism technologies could have a negative impact if they are not accessible. In the existing literature, no studies were found on the accessibility of chatbots (Torres et al., 2018).

In this study, accessibility also refers to the ease of use of chatbot services. Some chatbots are difficult to use because they have a complex interface, a complicated registration process, they require downloading an application, which could have a negative impact on their use. Perceived ease of use is a significant predictor of intention of use (Ashfaq et al., 2020). Ease of use has been regarded as a crucial factor to enhance customer satisfaction, especially in the technological context (Choi, Wang, & Sparks, 2019). For people with little need for interaction with a service employee, greater ease of use will lead to greater satisfaction (Ashfaq et al., 2020). Therefore, we hypothesize that:

H6. Accessibility positively influences users' satisfaction with destination chatbots.

H7. Informativeness positively influences destination image formation.

It has previously been shown that satisfactory tourism experiences positively influence destination image (Kim, K., Hallab, Z., & Kim, 2012; J. H. Kim, 2014). Thus, the attributes of STTs (informativeness, empathy and accessibility), in addition to having a direct impact on tourist satisfaction, must indirectly influence destination image formation. Consequently, the following hypotheses are proposed regarding the mediator role of chatbot usage satisfaction:

H8a: Chatbot usage satisfaction mediates the impact of informativeness on destination image formation

H8b: Chatbot usage satisfaction mediates the impact of empathy on destination image formation

H8c: Chatbot usage satisfaction mediates the impact of accessibility on destination image formation

Figure 1 shows the proposed model

Insert Figure 1

Methodology

Experiment, sample and data collection

This research is a case study based on an experiment using the tourist destination chatbot "*Victoria la Malagueña*", winner of the Chatbot Tourism Awards 2019. The Malaga chatbot was chosen because it was the winning destination of 2020 European Capitals of Smart Tourism.

The chatbot analyzed can be accessed through the Facebook messenger interface and also using the Google Assistant. It is accessible on laptops, tablets, iPhone or Android mobile devices. The main function of the chatbot is to provide information about the city's attractions, tourist routes, museums and theaters, types of restaurants, the weather and beaches, parking lots, and information on public transport, among others.

The experiment was divided into two phases: Firstly, it consisted of explaining to the participants the characteristics of the tourism technologies, and the advantages in the tourism industry, including chatbots. Second, the participants had to interact with the chatbot and generate a human-chatbot conversation session. The interactions were carried out in Spanish for an average of five minutes. This is the average time spent on interaction experiments with chatbots, which has been implemented in studies such as the one by De Cicco, Silva, & Alparone (2020). The participants had to interact with the chatbot to ask about the tourist attractions and services of the destination. After interacting with the chatbot, the participants proceeded to fill out a questionnaire about their experience using the chatbot. The questionnaire was distributed in Spanish as it is the native language of the respondents. Also, all participants answered the same set of questions. The study was carried out between October and November 2019 and the technique used was convenience sampling. It is important to note that data collection was done prior to the

COVID-19 pandemic outbreak and therefore the responses would be free of any bias that might result from the pandemic. This non-probability and non-random sampling technique was chosen due to its accessibility and ease of operation. We had access to participants who belonged to the population of interest. When using this technique, habits, opinions, and points of view can be observed more easily.

The chosen destination was the city of Malaga, Spain. The majority of respondents, being of Spanish nationality, may have had some knowledge of the destination, although due to the remoteness of the destination with respect to the sample, very few of them had actually visited the destination previously. The instructions on how to use the chatbot and what to ask were given in the respondents'classrooms. To calculate the minimum sample size in AMOS, we resorted to Soper's calculations (Soper, 2021). From the number of observed (21) and latent variables (5) in the model, the anticipated effect size (3 = medium), the desired probability (0.05) and statistical power levels (0.8), the recommended sample was deemed to be 150. The final sample consisted of 247 students from Rovira i Virgili University, Tarragona, Spain. Previously, a pilot study was carried out with 25 respondents that served to make minor changes.

Questionnaire development

The questionnaire asked the participants to provide their demographic information. All indicators were adapted from previous studies. Those that measured informativeness and accessibility in STT were adapted from studies by No & Kim (No & Kim, 2015) and Pavlou et al. (Pavlou, Liang, & Xue, 2007), and those that measured perceived empathy, from studies by Chaves & Gerosa (Chaves & Gerosa, 2019) and Paiva et al. (Paiva et al., 2017). The items that measured destination image were adapted from the study by Lee & Lockshin (2011). All indicators were measured on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). Additionally, we also measured

chatbot usage satisfaction (CUS) from previous studies (Lin & Hsieh, 2007). The satisfaction item relied on a seven-point Likert scale [1 = Not at all satisfied; 7 = Very Satisfied].

Data analysis

Data analysis was carried out using SPSS 25 and AMOS 24 statistical software. The two-step procedure suggested by Anderson and Gerbing (1988) was then followed. First, confirmatory factor analysis (CFA) was applied to verify the internal consistency of the constructs through the reliability, validity and one-dimensional requirements of the indicators. Second, structural equation modeling (SEM) was performed to evaluate the proposed model and its adjustments, as well as to test the proposed interrelationships between the theoretical attributes of the STT, satisfaction when using the chatbot and the image created. Some of the settings that were used to evaluate the model are: x^2/df (degree of freedom), comparative fit index (CFI), root mean square error of approximation (RMSEA), incremental fit index (IFI), Tucker- Lewis (TLI), and standardized root mean square residual (SRMR).

Sample description

Most of the participants were aged between 18 and 24 years (96.4%). The information that the participants requested from the chatbot according to the ranking of preferences was: gastronomy, tourist routes, museums, transport and monuments. A total of 51.4% of respondents travel once a year, with a higher percentage among women (men = 11.33%; women = 40.07%). While 22.3% travel twice a year. See Table 1

Insert Table 1

Assessment of the structural model

The CFA allowed us to evaluate the general fit of the measurement model. All the goodness of fit indices in this study suggest that the measurement model fits the

data: x^2/df = 2.23, CFI = 0.94, RMSEA = 0.07, SRMR = 0.07, IFI = 0.94, TLI = 0.93 suggested by Hair, Black, Babin, & Anderson (2010). As shown in Table 2, the individual reliability analysis of the indicators shows that most have a load greater than 0.5, the acceptable threshold (Hair, Black, Babin, Anderson, & Tatham, 1998). A standardized factor loading less than 0.4 can be considered problematic in the structure of the model (Ford, MacCallum, & Tait, 1986).

The internal consistency of the constructs was analyzed through Cronbach's Alpha and Composite Reliability (CR), which were higher than the minimum cut-off value of 0.70 (Fornell & Larcker, 1981). Average variance extracted (AVE) values were greater than the 0.05 threshold (see Table 2). Finally, the discriminant validity was confirmed because correlations between intra-constructs were lower than the stable root of the AVE. See Table 3.

Insert Table 2

Insert Table 3

Results of structural equation modeling

Once the measurement model had been developed, the next step was to examine the structural model to statistically verify the theoretically established paths and confirm the hypotheses raised. The results refer to informativeness, which refers to tourists' perception of receiving relevant, reliable and quality information from the chatbot during a conversational session. This is the attribute that most influences CUS ($\beta = 0.71$, $p < 0.001$). Empathy, which refers to the generation of emotionally appropriate responses in chatbot-tourist *chitchat*, also positively and significantly influences CUS ($\beta = 0.24$, $p < 0.001$). Therefore, H2 and H6 are supported and mean that suitable, quality information from chatbots and the users' perception of empathy generate satisfaction with the chatbots. However, accessibility, defined as ease in terms of using and accessing (24/7

connectivity) the chatbot without complications, was not significant for chatbot usage satisfaction (β = 0.00, p > 0.10). Therefore, hypothesis H4 is not supported. This means that chatbot accessibility does not influence satisfaction with the user experience.

The results also show that informativeness influences DI (β = 0.232, p < 0.100), therefore hypothesis H3 is supported. This means that the suitable, quality information provided by chatbots has a positive influence on the image of destinations created by users. Therefore, the better the information provided, the better the destination image created. Also, empathy influences DI (β = 0.16, p < 0.05), thus H7 is supported. In contrast, accessibility (β = 0.013, p > 0.10) does not influence DI. These results confirm H5. This means that these attributes do not influence the generation of DI. On the other hand, CUS does have a positive and significant influence on DI (β = 0.31, p < 0.001), and consequently H1 is supported. This means that the satisfaction generated by using chatbots creates a better DI among users. In other words, the greater the satisfaction when using the chatbot, the better the image it will generate of the destination. Finally, the study shows that demographic variables do not influence DI. The measurement model could represent 72.5% of the variation in CUS (R^2 = 0.725) and 38% in DI (R^2 = 0.38). See Table 4 and Figure 1.

Insert Table 4

Insert Figure 2

Analyzing multiple mediating effects

The bootstrapping method was used to test the significance of the indirect or mediating effects of CUS. A confidence level of 95 percent indicates the occurrence of mediation. As shown in Table 5, CUS is found to act as a perfect mediator between the informativeness, empathy, and DI constructs. These results supported H8a and H8c. This means that the satisfaction generated in users by quality information and empathic

treatment generates a positive DI in said users. Surprisingly, CUS does not play a mediating role between image and accessibility. In other words, the satisfaction generated by easy accessibility to the chatbot does not generate a positive DI. Thus, H8b is unsupported.

Insert Table 5

Discussion and conclusion

The present study examines the theoretical attributes of smart tourism technologies (informativeness, accessibility and empathy) and their influence on satisfaction in the use of the chatbot analyzed. Moreover, we intended to find out how chatbot usage satisfaction is a mediator in the creation of a positive image of the destination. As such, the study shows empirically that users had a satisfactory experience while using the "Victoria la Malagueña" chatbot. These results corroborate previous studies that showed that new technologies have expanded the experiential process (Chen et al., 2017; Neuhofer et al., 2014) and have fostered satisfactory tourist experiences (Tussyadiah, 2020). The results are in line with other studies that have shown the positive impact of AI, chatbots and robots in generating satisfactory tourist experiences in the hospitality sector (Kuo et al., 2017).

Moreover, the study shows the mediating influence of satisfactory tourist experiences by using chatbots to create a positive DI prior to traveling. Therefore, it shows that generating satisfactory experiences through using chatbots also generates a positive image of the destination. This corroborates the results of previous studies that have shown that tourism experiences decisively influence the formation of DI (Kim, 2014; Tung & Ritchie, 2011).

Another notable finding is that informativeness has a direct influence on successful tourist experiences, through the use of chatbot, and on DI. Thus, tourists are

more likely to feel a strong sense of satisfaction when they use a chatbot that offers useful and quality information. Furthermore, CUS is a mediating variable between informativeness and DI. Therefore, satisfaction through quality information provided by chatbots also generates a positive image of destinations. These findings coincide with previous studies that demonstrated that the quality of the information provided by ICT generates satisfactory tourist experiences (Wang & Lin, 2012), and informativeness plays a key role in shaping destination image (Govers & Go, 2004).

The study has also shown that the empathetic responses of the chatbot generate satisfaction with its use. Nonetheless, the empathy construct does not influence the creation of a positive image of the destination. The multiple mediation analysis offers further insight into such interesting findings and the empathy factor, which indirectly transmits its influence towards the destination image through satisfaction with chatbot usage. These results coincide with previous studies which, regarding empathy, showed that addressing affect and emotion in dialogue systems or conversation agents can improve user satisfaction (Prendinger & Ishizuka, 2005) . Zhou et al. (2020) showed that chatbots with empathetic abilities and social skills for understanding emotions, create greater satisfaction among users; and it probably helps toward making a travel decision, which is consistent with the studies about destination image (Baloglu & McCleary, 1999).

In addition, it is surprising to learn that chatbot accessibility does not lead to a more satisfactory tourist experience or the creation of a better image of the destination. These results, on the one hand, contradict previous studies that showed that accessibility in ICT is an important factor when creating satisfactory tourist experiences (Buonincontri & Micera, 2016). On the other hand, these results coincide with a study by Jeong and Shin (2020) who found that accessibility had no significant influence over memorable experiences, due to the current high technological infrastructure of smart tourist

destinations, fully equipped with high capacity bandwidth. Moreover, the result of the accessibility factor also coincides with the study by Melián-González et al. (2021) because the relationship between effort expectancy (referring to the degree of ease associated with consumers' use of technology, i.e., similar to the accessibility attribute in our study) and usage intention was not confirmed. The low influence of accessibility on tourist satisfaction might be due to the fact that using a chatbot does not require much effort, because chatbots already have maximum accessibility levels, or because the study participants, being young, do not give much importance to accessibility since they possess a natural ability to access technology. Thus, using a chatbot is easy and accessible.

The main limitation of the study, which is an experiment, is that it is based on the navigation of only one destination chatbot. In future research, it would be interesting to expand the number of chatbots analyzed, also from different countries, to find out if the results differ.

This study contributes to the extant literature by identifying the influence of certain chatbot attributes in creating DI through a mediation model. Moreover, the study has managerial implications and provides DMOs with practical insights for the creation of destination chatbots in order to improve tourists' destination image formation.

Managerial implications

This work provides DMOs with practical insights into the use of destination chatbots and their influence on DI. According to the results, practitioners should consider all the chatbot factors identified in this work, especially informativeness, which could greatly influence the destination image and, in turn, has a crucial role in tourist behavior and decision-making. Therefore, it is important that the DMOs should continue to strengthen this attribute with updated information on tourist services and activities in the

destination, thus allowing tourists to receive the information they need via the chatbot at any time, be fully informed, and make decisions in real time.

Along the same lines, the study also shows DMOs or chatbot creators that they must work to create more empathetic chatbots. Chatbots have generated a great deal of interest in providing technology-based tourism services, due to advances in machine learning and natural language processing, which have allowed incorporating social skills such as empathy. Thus, to improve tourism experiences, practitioners and chatbot designers should consider this attribute when constructing their system architecture, so that the chatbot may incorporate empathetic capacities, social skills (Zhou et al., 2020), and even a sense of humor to generate a better conversational experience (Fung et al., 2018).

Theoretical implications

The study has shown the influence of certain chatbot attributes in creating DI through a mediation model. Although the first stage of the analysis revealed a direct influence of empathy on DI, the multiple mediation analysis suggests that empathy exerts a significant indirect influence on DI through CUS. Thus, the indirect effects of the exogenous variable (empathy) have been shown to be important for the endogenous variable (DI). Therefore, the demonstration of the importance of the empathy factor is a theoretical contribution of our study, since it expands on the STT attributes by No and Kim (No & Kim, 2015).

Future researches should focus on expanding and analyzing other STT attributes, such as data security and personalization, especially in chatbots oriented toward tourist services; as the user must necessarily input sensitive personal information such as credit card or passport number to schedule a reservation.

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