User Usable Experience: A three-dimensional approach on usability in tourism websites and a model for its evaluation

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ABSTRACT

A standardized website evaluation model is needed in the tourism sector. This research article aims at revising previous models and updating them to contribute with a unified evaluation model for the analysis of web quality that incorporates a three-dimensional approach on usability, since usability is closely related to graphic design and navigability. This perspective has not been stated before. To test this correlation, a model to evaluate User Usable Experience (UUX) which integrates this three-dimensional approach on usability is proposed and a set of indicators that have been devised from a close bibliographic revision of previous web analysis models is shown. Its application to a purposive sampling verifies the positive correlation among the three above mentioned parameters by means of a multiple linear regression model. The results confirm the need to analyse UUX from a three-dimensional perspective on usability.

1. Introduction

The web 2.0 model was meant to be eminently social (Pérez Curiel & Luque Ortiz, 2018), enhancing the communication and interaction of human beings through individual messages, webmasters and other users (Cho & Cheon, 2005). In this context, usability, which is a crucial element in human-computer interaction [HCI] (Hornbæk, 2006), acquires a protagonist role.

The concept of usability, *aka* ease of use, is described as the capability of a website to be used easily and effectively (Shackel, 1991). Following Agag and El-Masry (2017, p. 361) perceived ease of use is one of the crucial success factors "for building trust toward online travel websites and consequently, attitude and intentions to purchase travel online".

In this paper, usability will be examined together with other key web quality parameters and indicators (Codina, 2008a; Martínez-Sala, 2018) such as graphic design and navigability. These parameters, i.e. usability, graphic design and navigability, have been considered in different website quality evaluation models, but never from the perspective of the interrelation between graphic design and navigability on usability. The initial choice of these three parameters was based upon the results and conclusions of a previous research (Martínez-Sala, 2015) which showed evidence of the correlation of graphic design and navigability on usability and the great importance of usability in the

context of web 2.0 (Agag & El-Masry, 2017; Hornbæk, 2006). From now on, when mentioning User Usable Experience (UUX), we will refer to this three-dimensional approach on usability. The concept of UUX has been chosen because of its close relation between usability and user experience satisfaction since the basic premises of usability: effectiveness, efficiency, ease of use, etc., have to be fulfilled (Nielsen, 1999; Nielsen, 2000). Besides, this concept (UUX) makes a clear reference to usability (International Organization for Standarization, 2010). In this way, the use of usability parameters and indicators to evaluate UUX is validated. In this research, some other variables related to graphic design and navigability to verify if, as expected (Martínez-Sala, 2015), the correct and coordinated implementation of these three parameters contribute to make a web fully usable which guarantees the UUX, proving the need of a new three-dimensional approach on usability.

Previous research on the evaluation of tourism destination websites has been widely explored (Law, Qi, & Buhalis, 2010). However, there is no standardized model for website quality evaluation (Cao & Yang, 2016; Park & Gretzel, 2007; Túñez-López, Altamirano, & Valarezo, 2016) which guarantees the efficiency of a website and establishes the aspects to be improved in order that users may opt for it (Tierney, 2000). This is essential for destination marketing organization [DMO] since the great competitiveness of the sector (Armenski, Dwyer, & Pavluković, 2017). As Cao and Yang (2016), Chiou, Lin, and Perng (2010) and Park and Gretzel (2007) stated, a unified model of success

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factors of a website based on the existing models was necessary and would mean a relevant contribution in the academic and professional areas. Therefore, this research aims at verifying if UUX depends on the coordinated application of a series of indicators related to usability, graphic design (visual appearance and aesthetics) and navigability, making a proposal for a model of analysis of UUX that unifies the existing contributions and conclusions around this concept under a new approach on a three-dimensional scope. Its application will let us verify the correlation among graphic design, navigability and usability.

The main contribution of this paper is the revision of the academic literature around the topic of tourism website quality evaluation and thus provides a standardized model for common agreement in the 2.0 context. This proposal will help overcome the existing gaps from constant technological change. To achieve this, the focus of the research will be on Official Destination Websites: tourist websites promoted by state institutions responsible for the development and promotion of national tourist destinations (cities, provinces, autonomous communities, countries, etc.) which, in Spain, are state-run. In the theoretical framework, tourism destination websites and tourism websites have both been revised. Tourism destination websites are the responsibility for the local governments, even if some private managerial action may affect them. On the other hand, tourism websites would mean any other website devoted to tourism. Under this category, different typologies of webs such as personal webs (blogs, etc.) and webs from tourist service companies (estate agencies, tour operators, transport companies, hotels, etc.) specialized portals like Trivago, etc.

In the managerial area, the contribution lies in the importance of maintaining successful websites because they have become platforms for promoting products and services and channels to generate revenue when attracting more customers (Chiou et al., 2010). To achieve this, web DMO managers are expected to guarantee the usability (Agag & El-Masry, 2017; Alcántara-Pilar, Blanco-Encomienda, Armenski, & Del Barrio-García, 2017). The model proposed in our study helps to achieve this goal. To achieve this, DMO managers can use the indicators of the proposed model of evaluation as rubrics to be checked in the design of websites and the evaluation of other existing websites. In the last case, the results of the analysis will show which aspects must be added and/or corrected to guarantee UUX. The model has been proposed and explained to be used by people with no previous training in web design and development. However, the modifications in the website and actions for improvement have to be implemented but professional experts.

2. Usability

Usability is present in most of the research about quality in websites (Agag & El-Masry, 2017; Law et al., 2010; Park & Gretzel, 2007; Qi, Law, & Buhalis, 2008) because it is a determinant factor of consumer acceptance of new technology and a key indicator for building website trust (Agag & El-Masry, 2017). Following Alcántara-Pilar et al. (2017), p. 27) there is a close link between tourists' online satisfaction and website usability and this influence "greatly contributes to the positive affect towards the website and, indirectly, towards the destination itself."

Being the users the main protagonists of the web 2.0 (Barman & Martini, 2019; Garett, Chiu, Zhang, & Young, 2016; Nafría, 2008), and taking into consideration all the prolific literature about the topic, a series of checkpoints based on heuristic principles have been compiled, which integrate seven specific fields of usability analysis: contents, ergonomics, processes, errors, adaptation, interactivity and distribution (Table 2). These areas of usability analysis have been selected because they are the ones ever-present in the revised model analyses and were introduced by Nielsen (1993, 1995, 1999, 2000, 2010), a top reference in web usability. Their rationale and correlation on usability will be closely described, grouping processes, errors and adaptation under the same consideration, due to their common interrelationship.

2.1. Contents

The primary essence of tourism websites is the dissemination of quality information (Park & Gretzel, 2007). Not surprisingly, the number of studies analysing the contents of websites has increased considerably since the year 2000 (Camprubí & Coromina, 2016).

Also, in the field of tourism, the evaluation of the content of tourism websites is always present in the research being done (Fernández-Cavia et al., 2013; Hashim, Murphy, & Law, 2007). However, its evaluation in relation to web quality parameters has not always been performed from the same perspective.

Lu, Lu, and Zhang (2002) conclude that information content is the most important factor for users to determine the quality of a website. Doolin, Burgess, and Cooper (2002) associate information content with the commercial function. Some other authors, like Chung and Law (2003) associate it with functionality, and finally Alcántara-Pilar et al. (2017) associate it with perceived usability.

In the web 2.0, information is one of the main reasons why tourists use the Internet (Law et al., 2010; Luna-Nevarez & Hyman, 2012; Park & Gretzel, 2007). The relation of contents with usability comes both from the contents and from the way users get that information. Thus, contents must be considered as an indicator of the usability parameter. This relationship was identified by Lu et al. (2002).

2.2. Ergonomics

Ergonomics and usability have been linked together by authors such as Park and Gretzel (2007). Within the field of ergonomics, ease of use, flexibility, multimedia resources and speed (Ackermann & Hartman, 2003; Ayuso García & Martínez Navarro, 2006; Codina, 2008b) will be considered as indicators of usability, as it has been done in other research works that will be outlined below.

Park and Gretzel (2007) stated ease of use as an indicator commonly included in website evaluation models and that it is very often incorporated within the parameter of usability. Regarding flexibility, i.e. the ability of the system to adapt to the changes required by the user, Shackel (1991) and Petrie and Bevan (2009) considered it as a determining factor of usability. However, instead of flexibility, Ayuso García and Martínez Navarro (2006) and Codina (2008b) would rather talk about adaptation and adaptability, which is the possibility of performing the most frequent tasks through varied, fast, efficient and customized ways (Hernon & Calvert, 2005; Nielsen, 1995).

Multimedia resources have been analysed from different perspectives, as indicators of the quality of the website content (Mich, Franch, & Martini, 2005), as indicators of its communicative aspects (Zhou & DeSantis, 2005) and also, of its interactive possibilities (Cho & Cheon, 2005; Doolin et al., 2002; Fernández-Cavia, Rovira, Díaz-Luque, & Cavaller, 2014). However, the impact of multimedia resources on usability has not been thoroughly analysed. This broader view was foreseen by Qi, Leung, Law, and Buhalis (2008) when linking multimedia resources to speed. The key function of speed is to ensure that websites load fast because long waiting times are one of the most common factors of user dissatisfaction (Lu et al., 2002). All in all, it can be said that multimedia resources and speed can be considered as determining aspects of website usability (Gupta, Jones, & Coleman, 2004) and essential requirements for tourism websites (Túñez-López et al., 2016).

2.3. Processes, errors and adaptation

Ayuso García and Martínez Navarro (2006), Codina (2008b) and Paz, Paz, Arenas, and Rosas (2018) refer to usability as a parameter in relation to the transactional aspects of the web. Therefore, processes, errors and adaptation of a website are claimed to be indicators of it. These processes and errors had been associated with usability by Lu et al. (2002) and Nielsen (1995) and were taken into consideration in research on tourism websites (Hashim et al., 2007). Regarding

adaptation and given the proliferation of mobile devices with internet access, this indicator requires nowadays the consideration of Responsive Web Design [RWD] (Frain, 2015). This RWD is a basic requirement to ensure user satisfaction (Sharkie & Fisher, 2013). This means it must be included as an indicator of usability. However, it has not been considered like that in the context of tourism websites, but in connection to the communicative dimension of them (Túñez-López et al., 2016).

2.4. Interactivity

The evaluation of interactivity has been the objective of many research studies (Luna-Nevarez & Hyman, 2012; Túñez-López et al., 2016). Fernández-Cavia et al. (2013) consider interactivity as part of the relational aspects of the website, and study it apart from usability, which is considered only a technical aspect. Other researchers such as Túñez-López et al. (2016) consider interactivity as one of the communicative aspects, also apart from usability. All in all, both viewpoints understand usability as a technical aspect within the website. The evaluation of interactivity is performed across its three dimensions (Cho & Cheon, 2005; Míguez González & Fernández-Cavia, 2015).

The consideration of this indicator within the usability parameter is due to the correlation between usability and user satisfaction. Users value and demand interactive channels (Cho & Cheon, 2005). Users satisfaction is the addition of their subjective interactive experiences (Lindgaard & Dudek, 2003). Following Altamirano, Túñez-López, and Paladines (2015), website user experience is clearly affected by the possibilities of interaction that the web offers to create its own experience, which has to be unique and satisfactory.

2.5. Distribution and marketing

The importance of tourism websites in the marketing of tourist destinations has been highlighted by many researchers (Agag & El-Masry, 2017; Cao & Yang, 2016; Fernández-Cavia et al., 2013; Lee & Gretzel, 2012; Luna-Nevarez & Hyman, 2012). Míguez González and Fernández-Cavia (2015) also agree that one of the main objectives of official tourism websites is to act as channels for the marketing of destinations and their products and services. In spite of that, some previous research pointed out the fact that the commercial function is an emerging feature in official tourism websites (Martínez-Sala, 2018), even if destination websites are "complex communication tools, which impact on several levels – from destination management to destination promotion and commercialisation" (Inversini, Cantoni, & De Pietro, 2014, p. 565).

Therefore, the commercial function of tourism websites has been analysed in the private sector (Agag & El-Masry, 2017; Chung & Law, 2003; Gupta et al., 2004; Qi, Law, & Buhalis, 2008; Qi, Leung, et al., 2008) and in the public sphere (Doolin et al., 2002; Martínez-Sala, 2018). The commercial function of a website is said to be fully achieved when it allows users to carry out online transactions (Doolin et al., 2002). The e-commerce function is argued to be an expected function for tourists from technologically advanced markets (Minghetti & Buhalis, 2010). Securing bookings on the official destination websites is a tactic that helps convert intentional visits into actual ones (Li & Wang, 2011). This feature also helps to maintain costs of the official and destination websites and to feed traffic to the local tourist industry (Qi, Law, & Buhalis, 2008).

The commercial function of a website is a quality indicator of it and its relation to user satisfaction can be considered as an indicator of usability. A website is usable when it allows the user to complete the successive stages involved in the buying and the planning of trips because these processes are reasons for user satisfaction (Martínez-Sala, 2018).

3. Usability and graphic design (visual aspect and aesthetics)

Web design is presented in relation to visual and aesthetics (Lavie & Tractinsky, 2004) encouraging the use of websites (Hassan Montero, 2006; Lindgaard & Dudek, 2003; van der Heijden, 2003) through the evocation of emotions (Kim, Lee, & Choi, 2003) that produce satisfaction (Lindgaard & Dudek, 2003; van der Heijden, 2003).

Graphic design is a frequent criterion in website evaluation models, and it has also been identified as one of the factors of their success. The indicators to evaluate the parameter of graphic design vary across the different research studies and website evaluation models (Park & Gretzel, 2007). Some of these indicators are related to website aesthetics such as visual attractiveness, the organization of elements, fonts, colour schemes, graphics, multimedia elements, and style (Tan & Tung, 2003) and were examined in the field of tourism (Yeung & Law, 2006) because they help to arise interest among online travellers (Han & Mills, 2006). They also contribute to the evocation of the destination, generating positive attitudes and trust (Lee & Gretzel, 2012; Mich et al., 2005). Consumers create an image of the tourist destination prior to the trip as a result of the graphic design and the actual images projected on tourist destination websites (Önder & Marchiori, 2017). The image users create is essential to determine their final decision to visit the destination (Alcántara-Pilar, Armenski, Blanco-Encomienda, & Del Barrio-García, 2018).

Moreover, Luna-Nevarez and Hyman (2012) claimed that aesthetic elements enhance the visual attractiveness and improve the dissemination of information. Also, legibility, clarity and the correct distribution of elements, which are indicators of graphic design, improve user experience and confer credibility to the site, which is essential to achieve user satisfaction (Wang, Head, & Archer, 2000).

With regards to the relationship between graphic design and usability, van der Heijden (2003) concluded that the visual attractiveness of websites influences the perception of ease of use, while Skadberg and Kimmel (2004) and Lindgaard and Dudek (2003) examined how design can facilitate usability.

Karvonen (2000) argued that simplicity is the link between usability and aesthetics, since it is both a requirement for usability (Nielsen, 1993; Nielsen, 1999) and an aesthetic notion. Lavie and Tractinsky (2004) found a positive correlation between perceived aesthetics and usability, validating the results of earlier research works (Tractinsky, Katz, & Ikar, 2000). Finally, Vladimirov (2012) confirmed the relationship between usability and website design from the viewpoint of the degree of ease.

These studies confirmed the correlation between graphic design and usability. In the tourism field, Yeung and Law (2006) mentioned this correlation, but its effects have not been clearly specified and considered as inseparable requirements.

From all the revision of existing literature about the topic, there is a series of indicators related to the evaluation of graphic design linked to UUX of the website that can be seen in Table 2. Also, the following hypothesis is proposed in the present study:

Hypothesis 1.1. (H.1.1.). Graphic design correlates with the UUX in website.

4. Usability and navigability

Navigation or navigability are key factors of the quality and success of a website (Park & Gretzel, 2007; Schmidt, Cantallops, & dos Santos, 2008). Their main function is circumscribed to the provision of tools or aids that enable users to move across pages (Gretzel, Yuan, & Fesenmaier, 2000) and reach contents (Schmidt et al., 2008) quickly and easily.

Park and Gretzel (2007) and Law et al. (2010) have confirmed that navigation systems and elements are a frequent criterion in studies and research on the evaluation of tourism websites. In this and other fields,

navigation has been always related to technical and structural dimensions of the website.

Some research and models of quality website evaluation have been developed reflecting the relationship between navigability and usability (Agag & El-Masry, 2017; Alcántara-Pilar et al., 2017; Yeung & Law, 2006). Thus, this relation justifies the inclusion of navigability and its indicators in the evaluation model of UUX proposed in this research (Table 2). The implementation of this model will let us verify a correlation, corroborating (or not) the following hypothesis:

Hypothesis 1.2. (H.1.2.). Navigability correlates the UUX in websites.

The probable confirmation of the two hypotheses (H.1.1 y H.1.2) lead to the main hypothesis of the research:

Hypothesis 1 (H.1): In the context of travel 2.0, the UUX of official tourism websites depends on a series of specific usability indicators and of the coordinated application of some others indicators related to graphic design (visual appearance and aesthetics) and navigability.

To test this hypothesis, the correlation among usability, graphic design and navigability will be analysed in a sample of DMO websites. To put this into practice, a model of analysis has been devised (Table 2) from previous research and the models of analysis that have proved themselves effective (Table 1). The results serve to statistically verify the correlation among the parameters of analysis by means of a multiple linear regression model (Draper, Smith, & Smith, 1998; Peña Sánchez de Rivera, 2002).

To be able to tackle these hypothesis successfully is relevant because official tourism websites are crucial tools for DMO (Fernández-Cavia & Castro, 2015; Gretzel et al., 2000; Túñez-López et al., 2016) and also for the dissemination and selling processes of tourism destinations (Fernández-Cavia et al., 2013; Fernández-Cavia & Castro, 2015; Lee & Gretzel, 2012; Luna-Nevarez & Hyman, 2012).

5. Methodology

The reason why the topic of the present research is of key importance is that websites are essential tools for DMO. Taking this into account, the main hypothesis of this study has been stated, i.e., H.1: the UUX in official tourism website depends on a series of specific usability indicators and of the right and coordinated application of some other indicators related to graphic design and navigability. Two sub-hypotheses develop from this main proposal which are graphic design (H.1.1) and navigability (H.1.2), which play a major role on usability.

A website evaluation model is needed to verify the main hypothesis and sub-hypotheses of the present research. The model proposed updates the existing models and evaluates the usability of official tourism websites from a three-dimensional approach. The results will also allow us to verify the relationship between the previously considered parameters besides establishing good practices and identifying the errors that must be avoided in the development of websites that guarantee UUX in the environment 2.0.

5.1. Model for UUX evaluation in websites

The proposed model (Table 2) integrates three parameters of analysis (graphic design, navigability and usability). Each parameter represents the aspect of study on which observation focuses and comprises some indicators such as the ones provided by Codina (2008a, 2008b). The parameters have been selected after having established in the theoretical framework their relation and relevance which is the aim of this research: to evaluate the correlation among usability, graphic design and navigability. The corresponding indicators for those parameters have also been selected after the most important models for website evaluation have been checked. In this sense, previous studies and analysis models have been revised and checked to create an adequate model that can be applied to the websites that are the goal of the research from the 2.0 stage (Table 1).

Taking into consideration the ideas in the theoretical framework, the proposed model is structured around three parameters that are key to the research, and 43 indicators distributed as follows: Graphic Design, 4 indicators; Navigability, 11 indicators, and Usability, 28 indicators.

The parameter Graphic Design (visual appearance, aesthetics) covers those indicators related to graphic design which relate to usability. This way, their evaluation centers on those aspects related to the implementation of brand image at a graphic and audiovisual level, together with those concerning clarity and legibility. With regards to navigability, the 11 indicators which have been chosen are those that keep a closer relation with achieving a usable web. These ones relate to elements of navigability, their presentation and naming, being essential for the UUX, which means that the user can navigate in an easy and organized way. The premise of navigability in order to guarantee UUX is that users must know any time where they are, how they got there and where they can go from there.

The third and last parameter which has been examined, Usability, comprises 28 indicators that relate to the specific fields of usability analysis: content, ergonomics, processes, errors, adaptation, interactivity and distribution. The first indicator, which is Content: quantity and quality, evaluates from six indicators the quantity and quality of web information together with its updating. Ergonomics integrates 4 indicators related to the ease of web use, its capacity to perform the same action in different ways, the inclusion of multimedia elements and the way they affect the speed at which the website loads. The two indicators that integrate Processes let us learn in depth the potential of the web to inform the user about the processes that are being performed. Errors refer to those incomplete processes, which are key to the web usability by informing the user about the error and how to solve it. Adaptation evaluates the ability of the web to adapt to different technological gadgets, and also to the users (Frequent Access). An indicator connected to terms and policies is also included. Both fields of study Errors and Adaptation comprise three indicators. Interactivity analyses by means of six indicators the interactivity user-message, user-administrator and user-user. The last field which has been studied, Distribution and Marketing, refers to the commercialization of tourist products and services. By means of the 4 indicators mentioned what is evaluated is the possibility of booking and purchasing online these products and services and the flexibility and payment security in case of purchase.

In the proposed model, the parameter of usability is the one which the heaviest weight with a total amount of 28 indicators which represent approximately 65% of the evaluated indicators. Navigability represents 25% whereas Graphic Design reaches 10%. The weights for each of the parameters have been established regarding the impact of each of their indicators on the UUX. The selection of these indicators closely follows the standards of web usability.

The evaluation of all the indicators has been done following quantitative content analysis method. Content analysis is one of the major research techniques used in understanding the design and performance of websites (Camprubí & Coromina, 2016; Luna-Nevarez & Hyman, 2012; Rodríguez-Molina, Frías-Jamilena, & Castañeda-García, 2015). Quantitative methods are the most popular ones in website evaluation (Law et al., 2010). The quantitative content analysis is easy to be used, simplifies data gathering, minimizes errors (Cao & Yang, 2016) and makes comparisons with other research easier (Morrison, Taylor, & Douglas, 2004). Its implementation in the proposed model let us obtain an objective, systematic and quantitative description of the analysed websites. In content analysis, reproducibility is arguably the most important interpretation of reliability (Krippendorff, 2013). Its suitability has been confirmed by two well-experienced professors and scholars in the field of public communication and tourism marketing, and also, by the management professional staff of a prestigious digital marketing company, who carried out the first trial for the model on a sample website. Once being tried, the results of the model were discussed, and

Table 1

Main research studies on which the proposal of a model of analysis was based (Huertas Roig and Fernández-Cavia, 2006).

	PARAMETERS OF ANALYSIS						
	Graphic design	**Navigability**	**Usability**				
			Content	Ergonomics	Processes, errors and adaptation	Interactivity	Distribution and marketing
Ayuso García and Martínez Navarro (2006)	▪	▪	▪				
Agag and El-Masry (2017)		▪					▪
Alcántara-Pilar et al. (2017)	▪	▪	▪				
Codina (2008b)	▪	▪		▪	▪	▪	
Cho and Cheon (2005)				▪		▪	
Chung and Law (2003)			▪				▪
Doolin et al. (2002)			▪				▪
Fernández-Cavia et al. (2013)			▪				▪
Han and Mills (2006)	▪	▪					
Hashim et al. (2007)			▪		▪		
Huertas Roig and Fernández-Cavia (2006)	▪						
Law et al. (2010)		▪	▪				
Li, X. and Wang (2011)		▪	▪			▪	▪
Lu et al. (2002)			▪	▪	▪		
Luna-Nevarez and Hyman (2012)	▪	▪	▪	▪	▪		
Park and Gretzel (2007)	▪	▪	▪	▪	▪		
Qi, Leung et al. (2008)				▪	▪		▪
Tan and Tung (2003)	▪	▪					
Túñez-López et al. (2016)				▪	▪	▪	
Yeung and Law (2006)	▪	▪	▪				

those confusing or ambiguous indicators were described to guarantee their reproducibility (Krippendorff, 2013). The final proposal is shown in Table 2.

5.2. Website sampling and evaluation process

The sample comprises Spanish sun and beach destinations with the heaviest national and international tourism traffic: Catalonia, the Canary Islands, the Balearic Islands, Andalusia and the Valencian Community (Instituto de Turismo de España (Turespaña), 2016). Sun and beach destinations have been selected because of their relevance for the Spanish tourism industry (Martínez-Sala, 2018).

The final sample includes 13 different regional websites: four of them corresponding to autonomous communities and the rest of them are either provinces or islands. The selection was based on the following four criteria: being institutional websites from local governments, incorporating different kinds of destinations (autonomous communities and provinces/islands), aimed at tourists as final targets, and offering full access and navigation (Table 3).

The number and typology of the chosen websites is meaningful to assess the viability and validity of the methodology, the same way it has been presented in previous similar research being done by Fernández-Cavia et al. (2014).

The fieldwork research was carried out within a period of 6 months in 2016. Data collection started with the analysis of the contents and functions of the websites. These results were later quantitatively analysed based on three scales rated 0–1, 0–2 and 0–3, following the type of analysis by different web tourism researchers (Fernández-Cavia et al., 2013; Fernández-Cavia et al., 2014; Luna-Nevarez & Hyman, 2012). The shortest rating, which is 0–1 is used for those features that are present (1) or not (0). For example, the indicator "Consequences" offers two possibilities: whether the information about the consequences of errors is provided (1) or not (0). The longest rating 0–3 shows different shades of meaning, such as poor (0), standard (1), good (2), or excellent (3) might be for the indicator "Brand image".

Each website was examined in detail to access all the levels of the websites in order to assess indicators such as navigation and consistency (Fernández-Cavia et al., 2013; Mich et al., 2005). Besides, to evaluate the three levels of interactivity (Cho & Cheon, 2005), interaction channels and tools available in the websites were checked.

The analysis was carried out independently by the authors and three coders that had been previously trained by the experts who validated

Table 2
UUX evaluation model in websites.

Parameter	Indicator	Definition	Score
Graphic design (visual appearance, aesthetics)			
	Brand image	Implementation of the functional and emotional elements of the brand, the brand logo, colour schemes, typography, style, tone, as well as the role of images and graphics.	0–3
	Discursive, argumentative and rhetorical analysis	Analysis of the expressive and visual language. The style of texts and images should be uniform, coherent with the brand image.	0–3
	Clarity	Adequate contrast between figure and background that fits the brand image and current trends without compromising on usability.	0–2
	Legibility	Use of typography that fits the brand image and current trends, without affecting the ease of reading.	0–2
Maximum score for graphic design (visual appearance, aesthetics)			2.50
Navigability			
	Main navigation (menu or system)	Permanent main navigation menu.	0–3
	Expressiveness	Capacity to express with a limited number of options the main contents in the main menu (constant navigation).	0–1
	Identification	Basic identification of the different contents based on title, source and date.	0–1
	Structural navigation	Possibility of making effective non-sequential navigation.	0–3
	Orientation	Indications of context.	0–3
	Hierarchy	Direct or indirect indication of the relevance of the different sections and subsections.	0–3
	Local navigation	Specific navigation system for some sections of the website.	0–1
	Remote navigation	Remote navigation elements, and supplemental navigation systems, such as tables of content, indexes and website maps.	0–3
	Semantic or hypertext navigation.	Links from some sections and subsections to other non-structurally related sections and subsections.	0–1
	Tags	Set of terms or icons used to name the different sections of the resource.	0–3
	Search engine	Offers the possibility of searching and/or retrieving information through questions or keywords.	0–3
Maximum score for navigability			2.27
Usability			
	Content: quantity and quality		
	Coherence between theme, audience and objectives	Clarity and coherence in the presentation of the website's theme, target audience and objectives and between these three elements.	0–1
	Interest, opportunity	Interest of the website towards the target audience, and opportunity of the subject matter presented in the website.	0–3
	Quantity	Volume of information.	0–3
	Rigor	Careful preparation and presentation of the information with regard to its foundation and veracity.	0–3
	Editing	Monitoring and correction of materials and contents for proper presentation.	0–3
	Updating	Update frequency of the resource.	0–3
	Ergonomics		
	Ease	Measures the general ease of use of the resource and tools, and the ease of access to content, etc.	0–3
	Flexibility	Capacity offered to the user by the recourse to perform the same action in different ways.	0–3
	Multimedia resources	Ease of use and operation of multimedia resources.	0–3
	Speed	Appropriate loading speed of content, multimedia resources, results of actions, etc.	0–3
	Processes		
	Display of status	Clear and precise display of the status of the process that is taking place in the website.	0–3
	Conventions	Information about the status through common language and familiar conventions for typical users of the website.	0–3
	Errors		
	Correction of errors	Possibility to undo the last action.	0–1
	Notification	Information that the system provides to the user when an error has occurred.	0–2
	Consequences	Information about the consequences of the error.	0–1
	Adaptation		
	Adaptation	Capacity of the resource to adapt to the previously defined preferences of each user. The ability to customize resource and implement RWD.	0–3
	Frequent access	Ease of access to frequent sections and functions: search engine, newsletter, news, weather, etc.	0–3
	Terms and policies	Easily accessible information about the policies and terms of service from the point of view of the obligations and rights of the person in charge of the website and the user.	0–3
	Interactivity		
	Contact information	Inclusion of a channel for users to get in touch with the people responsible for the website and provision of quick and personalized responses.	0–3
	Customized access	Possibility of customized access and capacity of the resource to adapt to the preferences the user indicated during his/her registration and to the preferences recorded in previous visits.	0–2
	Customized newsletter	Possibility given to users to receive an online-customized newsletter from the website.	0–2
	Specific applications (tourism)	Weather forecast, location map, trip planning and calculation, travel blog, etc.	0–3
	Specific applications (model 2.0)	Applications and services characteristic of the model 2.0 and relevant to the type of website under analysis: search engine, contact, RSS, mashups, etc.	0–3
	Blog and social networks.	Presence of links to the brand's own blog and major social networks.	0–3
	Distribution and marketing		
	Online purchasing and booking tools	The website offers the possibility to book, buy tourism products and services, such as accommodation, transport, restoration and complementary nature sports, cultural and leisure activities, etc.	0–1
	Links to websites enabled for online purchasing and booking	The website provides links to other websites that enable the user to book tourism products and services, such as accommodation, transport, restoration and complementary nature, sports, cultural and leisure activities, etc.	0–1
	Flexibility	Variety of payment options: card, transfer, online payment systems, etc.	0–3
	Security	Security of payment systems: PayPal, Google Wallet and Amazon Payments.	0–2
Maximum score for usability			2.50
Maximum score for UUX in websites			2.44

Table 3
Quantitative results.

Parameters/Indicators	Valencian community	Province of Alicante	City of Alicante	Castellon	Andalusia	Cadiz	Malaga	Granada	Almeria	Balearic Islands	Gran Canaria	Tenerife	Catalonia	Average score for parameters/ indicators	Weighted average score for parameters/ indicators
Graphic design															
Brand image	3	1	2	3	3	3	3	3	2	3	3	3	3	2.69	0.90
Discursive, argumentative and rhetorical analysis	3	2	3	3	3	3	3	3	2	3	3	3	3	2.85	0.95
Clarity	2	1	2	2	2	2	2	2	1	2	2	2	2	1.85	0.92
Legibility	2	2	2	2	2	2	2	2	1	2	2	2	2	1.92	0.96
Average score for graphic design	2.5	1.5	2.25	2.5	2.5	2.5	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.33	0.93
Navigability															
Main navigation	2	1	2	3	3	2	2	1	2	3	1	2	1	1.92	0.64
Expressiveness	0.5	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.46	0.46
Identification	1	0.5	0.5	1	1	1	1	1	0.5	0.5	1	1	0.5	0.81	0.81
Structural navigation	2	2	1	2	2	2	2	2	1	3	2	2	1	1.85	0.62
Orientation	2	2	0	2	2	2	2	2	1	2	1	2	1	1.62	0.54
Hierarchy	2	2	0	2	2	1	2	2	3	1	1	2	2	1.69	0.56
Local navigation	0.5	0.5	0.5	0.5	0.5	0	0.5	0.5	0.5	1	0.5	0.5	0.5	0.50	0.50
Remote navigation	3	2	2	3	3	2	3	2	2	1	2	2	2	2.23	0.74
Semantic or hypertext navigation.	1	0	0	0	1	0.5	1	0.5	1	0	1	1	1	0.62	0.62
Tags	2	1	2	2	2	2	2	2	2	3	1	3	1	1.92	0.64
Search engine	3	0	0	3	3	1	3	3	3	2	2	3	1	2.08	0.69
Average score for navigability	1.73	1.00	0.77	1.73	1.82	1.27	1.73	1.50	1.50	1.55	1.18	1.73	1.05	1.43	0.62
Usability															
Information content															
Coherence between theme, audience and objectives	1	0.5	1	1	1	1	1	0.5	1	1	1	1	1	0.92	0.92
Interest, opportunity	2	2	1	3	3	3	2	2	2	3	3	3	3	2.46	0.82
Quantity	2	2	1	3	2	2	3	2	2	2	2	3	2	2.15	0.72
Rigor	2	2	2	3	2	3	2	2	3	3	2	3	2	2.38	0.79
Editing	3	3	3	3	3	3	3	3	1	3	2	3	3	2.85	0.95
Updating	2	2	3	2	2	2	2	2	2	2	2	2	2	2.08	0.69
Average score for information content	2.00	1.92	1.83	2.50	2.17	2.33	2.17	1.92	1.83	2.33	2.17	2.50	2.17	2.14	0.82
Ergonomics															
Ease	2	1	1	2	2	1	2	1	2	2	2	2	2	1.69	0.56
Flexibility	3	2	2	3	2	2	3	1	2	0	1	2	1	1.85	0.62
Multimedia resources	3	2	1	2	1	2	3	2	2	1	3	3	2	2.08	0.69
Speed	3	2	3	3	3	3	3	3	2	3	3	3	3	2.85	0.95
Average score for ergonomics	2.75	1.75	1.75	2.50	2.00	2.00	2.75	1.75	2.00	1.50	2.25	2.50	2.00	2.12	0.71
Processes															
Display of status	3	0	0	3	3	2	3	3	3	2	2	3	2	2.23	0.74
Conventions	3	2	1	2	2	2	3	3	3	2	2	3	2	2.31	0.77
Average score for processes	3.00	1.00	0.50	2.50	2.00	2.00	3.00	3.00	3.00	2.00	2.00	3.00	2.00	2.27	0.76
Errors															
Correction of errors	1	0.5	0.5	1	1	1	1	1	1	1	0.5	1	0.5	0.85	0.85

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Table 3 (*continued*)

Parameters/Indicators	Valencian community	Province of Alicante	City of Alicante	Castellon	Andalusia	Cadiz	Malaga	Granada	Almeria	Balearic Islands	Gran Canaria	Tenerife	Catalonia	Average score for parameters/indicators	Weighted average score for parameters/indicators
Notifications	2	0	1	2	2	2	2	1	1	2	1	2	1	1.46	0.73
Consequences	1	1	0.5	1	1	1	2	0.5	0	1	0.5	1	1	0.81	0.81
Average score for errors	1.33	0.50	0.67	1.33	1.33	1.33	1.33	0.83	0.67	1.33	0.67	1.33	0.83	1.04	0.79
Adaptation															
Adaptation	2	2	2	1	2	1	3	1	1	2	1	1	1	1.54	0.51
Access	2	1	1	2	2	2	2	3	1	2	2	2	1	1.77	0.59
Terms and policies	3	0	1	3	3	3	3	3	3	3	3	3	3	2.62	0.87
Average score for adaptation	2.33	1.00	1.33	2.00	2.33	2.00	2.67	2.33	1.67	2.33	2.00	2.00	1.67	1.97	0.66
Interactivity															
Contact information	2	1	0	2	2	2	2	3	2	1	1	2	1	1.62	0.54
Customized access	2	0	0	0	2	0	0	0	0	0	0	2	0	0.46	0.23
Customized newsletter	1	1	1	1	1	1	0	0	0	2	0	0	0	0.77	0.38
Specific applications (tourism)	2	2	2	2	2	2	2	2	2	2	3	2	2	2.08	0.69
Specific applications (model 2.0)	2	1	2	3	2	3	3	2	2	2	3	3	2	2.31	0.77
Blog and social networks	3	3	3	2	2	2	3	0	0	0	3	3	3	2.08	0.69
Average score for interactivity	2.00	1.33	1.33	1.67	1.83	1.67	2.00	1.17	1.00	1.17	1.67	2.00	1.33	1.55	0.55
Distribution, marketing															
Online purchasing and booking tools	1	0	0	1	0	1	0	0	0	1	0	1	1	0.46	0.46
Links to websites enabled for online purchasing and booking	0.5	1	1	1	1	1	0.5	1	0.5	1	1	1	1	0.88	0.88
Flexibility	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Security	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average score for distribution, marketing	0.75	0.50	0.50	1.00	0.50	1.00	0.25	0.50	0.25	1.00	0.50	1.00	1.00	0.67	0.67
Average score for Usability	2.06	1.31	1.31	2.00	1.88	1.85	2.10	1.62	1.48	1.69	1.73	2.12	1.63	1.75	0.70
Total score (average score for UUX in websites)	1.92	1.19	1.20	1.88	1.84	1.67	1.94	1.59	1.42	1.65	1.58	1.95	1.49	1.06	0.42

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Table 4
Weighting results of the evaluation of official tourism websites.

	Graphic design (x1)	Navigability (x2)	Usability (y)
Valencian community	1.00	0.76	0.83
Province of Alicante	0.63	0.39	0.52
Alicante	0.92	0.35	0.53
Castellon	1.00	0.70	0.81
Andalusia	1.00	0.79	0.76
Cadiz	1.00	0.55	0.76
Malaga	1.00	0.76	0.81
Granada	1.00	0.65	0.62
Almeria	0.58	0.65	0.56
Balearic Islands	1.00	0.64	0.72
Gran Canaria	1.00	0.58	0.66
Tenerife	1.00	0.76	0.86
Catalonia	1.00	0.50	0.67
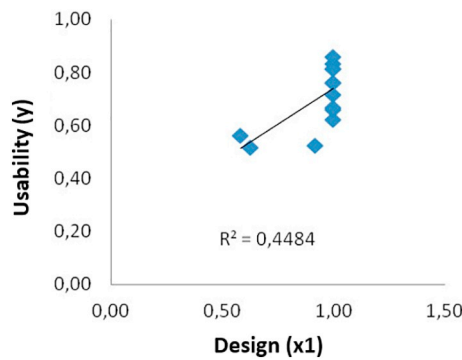
Fig. 1. Dispersion graph **y-x1**.
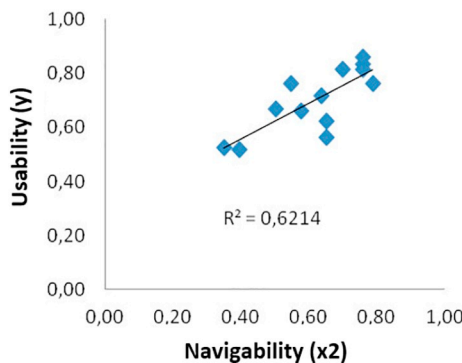
Fig. 2. Dispersion graph **y-x2**.

Table 5
ANOVA[a].

Model		Sum of squares	df	Root mean square	F	Sig.
1	Regression	0.129	2	064	18.180	.000[b]
	Residual	0.035	10	004		
	Total	0.164	12			

[a] Dependent variable: *usability*.
[b] Predictor variables: (constant), *navigability, graphic design.*

Table 6
Summary of the model[b].

Model	R	R squared	Adjusted R squared	Standard error of the estimate	Durbin-Watson
1	.886[a]	0.784	0.741	0.05949	2.246

[a] Predictor variables: (constant) navigability, design
[b] Dependent variable: usability

the model, always under the supervision of coders, such as it has been done in similar previous research (Fernández-Cavia et al., 2014; Míguez González & Fernández-Cavia, 2015; Zhou & DeSantis, 2005). The first results were checked to notice deviations which were discussed and checked by all the coders and the experts. Inter- and intra- expert reliability was guaranteed this way (Krippendorff, 2013).

Individual scores were added and averaged to make an overall assessment of each parameter (Table 3, "Average score for graphic design", "Average score for navigability" and "Average score for usability") and of UUX (Table 3, "Average score for UUX in websites). The indicators that could not be evaluated were labelled as "NOT APPLICABLE" [NA] and were not taken into consideration in the total number of indicators used as the main set to obtain the global evaluation of the parameter. It can be highlighted that the final scores of each of the parameters follow the weights that were assigned within the model aligning with the number of indicators that were set, thus confirming the proposed distribution.

Weights were eventually assigned to each indicator to obtain a combined score in a 0–1 scale (Fernández-Cavia et al., 2014) as it is introduced in Table 3, "Weighted Average Score for Parameters/Indicators". This stage was necessary to develop a linear regression model among the parameters: graphic design, navigability and usability.

6. Results

6.1. Implementation of the UUX evaluation model in websites: quantitative results in the field of the proposed three-dimensional approach to usability

The quantitative results of website evaluation are shown in Table 3.

6.2. Correlation between graphic design, navigability and usability

After having evaluated the websites and considered all the obtained results (see Table 3), a multiple linear regression model has been tested, being the target variable *Usability* and the auxiliary variables: *Design* and *Navigability* (Draper et al., 1998; Peña Sánchez de Rivera, 2002).

The notation to refer to each of the three parameters or variables of the linear regression model is as follows:
Target variable:

- Usability (y).

  Auxiliary variables:

- Graphic design (visual aspects, aesthetics) (x1).
- Navigability (x2).

Table 4 presents the results of the evaluation of the previous variables in the sample of websites (Table 4).

6.2.1. Dispersion graphs
Dispersion graphs were created to analyse the linear relationship between the auxiliary variables and the target variable (Figs. 1 and 2):

As we can see, the dispersion graph **y-x2** shows an R^2 large enough (0.6214) to establish a linear relationship between variables. Thus, we can affirm that the higher score in *usability*, the higher the score in *navigability*. However, the same cannot be said for the relationship between *usability* and *graphic design*, as they are not correlated.

6.2.2. Multiple linear regression model
We propose a multiple linear regression model for the aforementioned variables.

Taking into consideration the conclusions from the theoretical framework, a multiple linear regression model is proposed. This model is based on the hypothesis that average *usability* is a linear function of *graphic design* and *navigability*.

Table 7
Coefficients[a].

Model		Non-standardized coefficients		t	Sig.	Confidence interval of 95.0% for β		Collinearity statistics	
		β	SE			Lower limit	Upper limit	Tolerance	VIF
1	(Constant)	0.059	0.116	0.511	0.621	−0.199	0.317		
	Design	0.348	0.126	2.769	0.020	0.068	0.628	0.857	1.167
	Navigability	0.510	0.130	3.909	0.003	0.219	0.800	0.857	1.167

[a] Dependent variable: Usability.
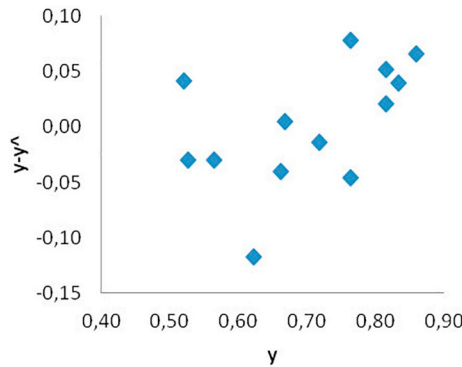
Fig. 3. Errors.
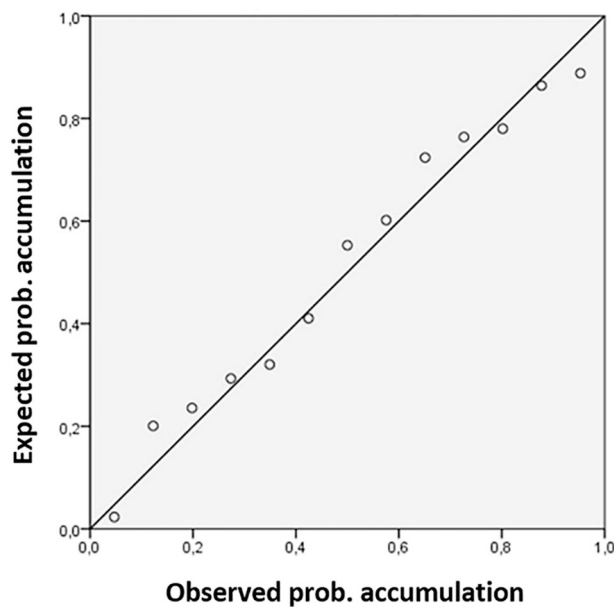
Fig. 4. Graph of normal P−P plot of regression standardized residual. Dependent variable: *Usability*.

The proposed notation is as follows:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \varepsilon$$

Moreover, the model proposes that errors (ε) follow a normal distribution with mean of 0 and variance of $\sigma^2 \sigma^2$; and that errors are independent. It is important to mention that each β_i with $i = 1,2,3$, is the average increase in *Usability* when increasing in one unit the corresponding auxiliary variable and keeping the rest constant.

The following table shows the ANOVA table resulting from the application of the least square method to the data of the sample (Table 5).

The previous table allows us to establish the contrast

$H_0: \beta_1 = \beta_2 = 0$

The results reject the null hypothesis with a *p*-value of 0.000.

6.2.3. Analysis of the model's hypothesis

This section examines the hypotheses formulated in the model proposed above.

In the table titled *Summary of the model* (Table 6), the Durbin-Watson statistic has a value of *2.246*, which falls between 1 and 3, so we can affirm that *errors are distributed independently*.

The *R squared* has a value of *0.784* so the model explains 78.4% of the variance, which can be considered to be *good*.

On the other hand, if we consider the individual contrasts:

$H_0: \beta_1 = 0$

$H_0: \beta_2 = 0$

There is enough statistical evidence to reject the null hypothesis in both contrasts, with *p-values of 0.020 for design and 0.003 for navigability*.

It can be said that both variables contribute positively to greater *usability*, since the higher the score these variables reach, the higher the score for *usability*.

Table 7 shows that the requirement of *non-collinearity* is met, with a VIF of 1.167, close to 1 for *Design* and *Navigability* (Table 7).

The graph titled *Errors* shows that *errors behave randomly* (Fig. 3).

As we can see in the next graph, *there is a normal distribution of errors* (Fig. 4).

After analysing the relationship between the target variable, *usability*, and the auxiliary variables, *Design* and *Navigability*, we developed a multiple linear regression model that confirmed that *usability*, the dependent variable, depends in a linear way on the correct and coordinated application of the principles of *graphic design* and *navigability*, the independent variables.

7. Discussion and conclusions

In the tourism sector, the features of a website that help create user preference towards a travel destination have special relevance for travel-related businesses. To date, several works have addressed the clear effect of usability (Pereira & Baranauskas, 2015) as one of those important features. Usability has been approached from different perspectives, but it has never been questioned from the three-dimensional approach that is introduced in this research, incorporating the concept of UUX. Therefore, and with the objective of testing the hypotheses of this research study (H.1, H.1.1. and H.1.2.), an evaluation model of UUX in websites was developed, taking into consideration those aspects. Two relevant contributions in the academic field have been done. Firstly, this model provides the context for a standardized model of analysis of tourism websites (Cao & Yang, 2016; Chiou et al., 2010; Park & Gretzel, 2007) which guarantees the fulfilment of its main objectives: dissemination and selling processes of tourism destinations (Fernández-Cavia et al., 2013; Fernández-Cavia & Castro, 2015; Lee & Gretzel, 2012; Li & Wang, 2011; Luna-Nevarez & Hyman, 2012; Minghetti & Buhalis, 2010). "The high level of academic interest on official destination websites is comprehensible given that these websites are the most tangible evidence of using technology for destination marketing in an otherwise very intangible virtual world." (Li, Robinson, & Oriade, 2017, p. 97). Secondly, the present research is a necessary revision of
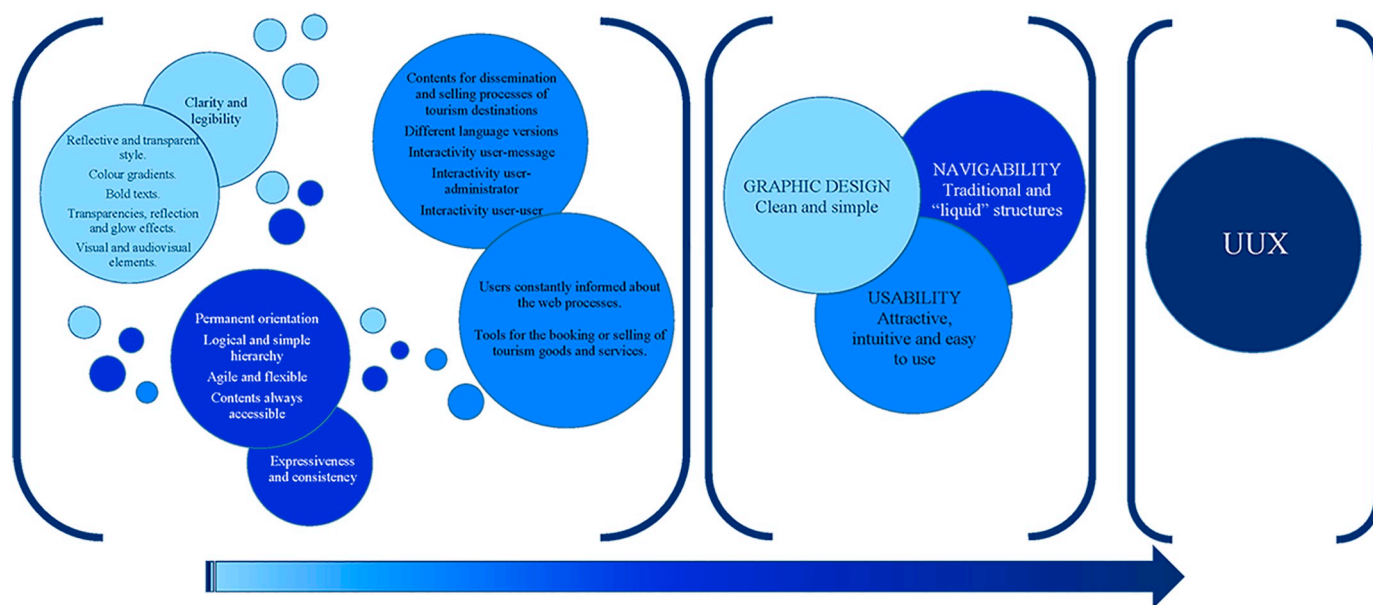
Fig. 5. Hints to check and improve UUX in tourism websites.

previous models of analysis in the context of 2.0. The implementation of the model of analysis proposed has let us verify the correlation of graphic design, usability and navigability in UUX and, therefore, the limitations that existing models have. These models evaluate usability from a unidimensional approach, ignoring its integrating perspective (García García & Castillo Díaz, 2010; Hassan Montero, 2006).

Professionally, a contribution has been made with an analysis of existing websites that helps DMO to improve them, establishing the guidelines to evaluate and/or create webs which guarantee UUX, which are essential for 2.0 tourists (Agag & El-Masry, 2017).

Regarding the starting hypotheses of this study, the main research hypothesis (H.1) is confirmed, stating that the UUX of the official tourism websites is the result of the application of the principles of usability and also of the coordinated and correct application of the principles of graphic design and navigability. The positive correlation among the three above mentioned parameters (usability, graphic design and navigability) has been confirmed conceptually and there is statistical evidence about it from the analysed sample. However, if each of these parameters is considered independently, it does not happen the same. There is correlation between navigability and usability (H.1.2) but there is not any correlation between graphic design and usability. Thus, the hypothesis H.1.1. is refused.

Once the main goals of the research have been achieved, the detailed analysis has enabled us to provide some hints of how to get a web which guarantees UUX (Fig. 5).

Although the research meets its objectives, it has certain limitations. We should point out the convenience of completing the proposed evaluation model with studies about users' motivations, as suggested by Law et al. (2010) and about users' perceptions due to the subjective dimension of usability (Hassan Montero, 2006; Hornbæk, 2006).

On the other hand, although the sample of the present research is enough for the main goals, it would be convenient to expand it to more national and international websites, also considering other types of destinations. A high number of websites and other tourism typologies will let us generalize the conclusions provided. Similarly, a greater sample will let us face questions that have aroused from this study like the low differentiation among tourism brands. Brand management is a key aspect in the tourism sector, which is characterized by many stakeholders that correlate and determine the brand image beyond the control of the destinations managers. In addition, most products and services refer to experiences and emotions (Senecal & Nantel, 2004)

that must be represented through a brand that distinguishes itself from its competitors.

Declaration of competing interest

None.

Acknowledgements

References

Ackermann, E., & Hartman, K. (2003). *The information specialist's guide to searching & researching on the Internet & the World Wide Web.* Wilsonville: ABF Content.

Agag, G. M., & El-Masry, A. (2017). Why do consumers trust online travel websites? Drivers and outcomes of consumer trust toward online travel websites. *Journal of Travel Research, 56*(3), 347–369. https://doi.org/10.1177/0047287516643185.

Alcántara-Pilar, J. M., Armenski, T., Blanco-Encomienda, F. J., & Del Barrio-García, S. (2018). Effects of cultural difference on users' online experience with a destination website: A structural equation modelling approach. *Journal of Destination Marketing & Management, 8*, 301–311. https://doi.org/10.1016/j.jdmm.2017.06.002.

Alcántara-Pilar, J. M., Blanco-Encomienda, F. J., Armenski, T., & Del Barrio-García, S. (2017). The antecedent role of online satisfaction, perceived risk online, and perceived website usability on the affect towards travel destinations. *Journal of Destination Marketing & Management.* https://doi.org/10.1016/j.jdmm.2017.09.005.

Altamirano, V., Túñez-López, M., & Paladines, F. (2015). Communication 2.0 to promote tourism in iberoamerica: Analysis of government web portals and social networks. *Paper presented at the 2015 10th Iberian Conference on Information Systems and Technologies, CISTI 2015* https://doi.org/10.1109/CISTI.2015.7170590.

Armenski, T., Dwyer, L., & Pavluković, V. (2017). Destination competitiveness. *Journal of Travel Research* 0047287517692445. https://doi.org/10.1177/0047287517692445.

Ayuso García, M. D., & Martínez Navarro, V. (2006). Evaluación de la calidad de fuentes y recursos digitales: guía de buenas prácticas. [Sources Quality Evaluation and Digital Resources: Good Practices Guide]. *Anales de Documentación, 9*, 17–42. Retrieved from http://revistas.um.es/analesdoc.

Barman, N., & Martini, M. G. (2019). QoE Modeling for HTTP adaptive video streaming–a survey and open challenges. *IEEE Access, 7*, 30831–30859. https://doi.org/10.1109/ACCESS.2019.2901778.

Camprubí, R., & Coromina, L. (2016). Content analysis in tourism research. *Tourism Management Perspectives, 18*, 134–140. https://doi.org/10.1016/j.tmp.2016.03.002.

Cao, K., & Yang, Z. (2016). A study of e-commerce adoption by tourism websites in China. *Journal of Destination Marketing & Management, 5*(3), 283–289. https://doi.org/10.1016/j.jdmm.2016.01.005.

Chiou, W., Lin, C., & Perng, C. (2010). A strategic framework for website evaluation based on a review of the literature from 1995–2006. *Information & Management, 47*(5),

282–290. https://doi.org/10.1016/j.im.2010.06.002.

Cho, C., & Cheon, H. J. (2005). Cross-cultural comparisons of interactivity on corporate web sites: The United States, the United Kingdom, Japan, and, South Korea. *Journal of Advertising, 34*(2), 99–115. https://doi.org/10.1080/00913367.2005.10639195.

Chung, T., & Law, R. (2003). Developing a performance indicator for hotel websites. *International Journal of Hospitality Management, 22*(1), 119–125. https://doi.org/10.1016/S0278-4319(02)00076-2.

Codina, L. (2008a). *Evaluación de calidad en sitios web: Metodología de proyectos de análisis sectoriales y de realización de auditorías (versión 7). Parte I: Procedimientos y desarrollo de indicadores. [Website Quality Evaluation: Project methodology sectoral analyzes and audits (version 7). Part I: Procedures and development indicators].* Barcelona: Universidad Pompeu Fabra.

Codina, L. (2008b). *Evaluación de calidad en sitios web: Metodología de proyectos de análisis sectoriales y de realización de auditorías (versión 7). Parte II: Parámetros e indicadores [Website Quality Evaluation: Project methodology sectoral analyzes and audits (version 7). Part II: Parameters and indicators].* Barcelona: Universidad Pompeu Fabra.

Doolin, B., Burgess, L., & Cooper, J. (2002). Evaluating the use of the web for tourism marketing: A case study from New Zealand. *Tourism Management, 23*(5), 557–561. https://doi.org/10.1016/S0261-5177(02)00014-6.

Draper, N. R., Smith, H., & Smith, H. (1998). *Applied regression analysis* (3rd ed.). New York: John Wiley & Sons.

Fernández-Cavia, J., & Castro, D. (2015). Communication and branding on national tourism websites. *Cuadernos.info, 2015*(37), 167–185. https://doi.org/10.7764/cdi.37.682.

Fernández-Cavia, J., Díaz-Luque, P., Huertas, A., Rovira, C., Pedraza-Jiménez, R., Sicilia, M., ... Míguez, M. (2013). Destination brands and website evaluation: A research methodology. [Destination brands and website evaluation: A research methodology]. *Revista Latina de Comunicación Social, 68*, 622–638. https://doi.org/10.4185/RLCS-2013-993en.

Fernández-Cavia, J., Rovira, C., Díaz-Luque, P., & Cavaller, V. (2014). Web quality index (WQI) for official tourist destination websites. Proposal for an assessment system. *Tourism Management Perspectives, 9*, 5–13. https://doi.org/10.1016/j.tmp.2013.10.003.

Frain, B. (2015). *Responsive web design with HTML5 and CSS3.* Birmingham: Packt Publishing Ltd.

García García, M., & Castillo Díaz, A. (2010). Usable and accessible websites in SMEs. Challenges for the future. *Revista Latina de Comunicación Social,* (65), 392–407. https://doi.org/10.4185/RLCS-65-2010-908-392-409-EN.

Garett, R., Chiu, J., Zhang, L., & Young, S. D. (2016). A literature review: Website design and user engagement. *Online Journal of Communication and Media Technologies, 6*(3), 1–14.

Gretzel, U., Yuan, Y., & Fesenmaier, D. R. (2000). Preparing for the new economy: Advertising strategies and change in destination marketing organizations. *Journal of Travel Research, 39*(2), 146–156. https://doi.org/10.1177/004728750003900204.

Gupta, H., Jones, E., & Coleman, P. (2004). How do Welsh tourism-SME websites approach customer relationship management? In A. J. Frew (Ed.). *Information and communication technologies in tourism 2004: Proceedings of the international conference in Cairo, Egypt 2004* (pp. 525–536). New York: Springer Vienna. https://doi.org/10.1007/978-3-7091-0594-8_49.

Han, J., & Mills, J. E. (2006). Zero acquaintance benchmarking at travel destination websites: What is the first impression that national tourism organizations try to make? *International Journal of Tourism Research, 8*(6), 405–430. https://doi.org/10.1002/jtr.581.

Hashim, N. H., Murphy, J., & Law, R. (2007). A review of hospitality website design frameworks. In M. Sigala, L. Mich, & J. Murphy (Eds.). *Information and communication technologies in tourism 2007: Proceedings of the international conference in Ljubljana, Slovenia, 2007* (pp. 219–230). New York: Springer Vienna. https://doi.org/10.1007/978-3-211-69566-1_21.

Hassan Montero, Y. (2006). Factores del diseño web orientado a la satisfacción y no frustración de uso. [Web design impact in the satisfaction and non-frustration of users]. *Revista Española de Documentacion Científica, 29*(2), 239–257. https://doi.org/10.3989/redc.2006.v29.i2.291.

van der Heijden, H. (2003). Factors influencing the usage of websites: The case of a generic portal in the Netherlands. *Information & Management, 40*(6), 541–549. https://doi.org/10.1016/S0378-7206(02)00079-4.

Hernon, P., & Calvert, P. (2005). E-service quality in libraries: Exploring its features and dimensions. *Library & Information Science Research, 27*(3), 377–404. https://doi.org/10.1016/j.lisr.2005.04.005.

Hornbæk, K. (2006). Current practice in measuring usability: Challenges to usability studies and research. *International Journal of Human-Computer Studies, 64*(2), 79–102. https://doi.org/10.1016/j.ijhcs.2005.06.002.

Huertas Roig, A., & Fernández-Cavia, J. (2006). *Ciudades en la web: usabilidad e interactividad de las páginas oficiales de los destinos turísticos. Turitec 2006: VI Congreso nacional turismo y tecnologías de la información y las comunicaciones [Cities on the Web: Usability and Interactivity of the Official websites of Tourist Destinations].* Málaga: Universidad de Málaga, Escuela Universitaria de Turismo403–421.

Instituto de Turismo de España (Turespaña) (2016). *COYUNTUR. Boletín Trimestral de Coyuntura Turística, n° 26, III trimestre 2016*.

International Organization for Standarization (2010). *ISO/IEC 9241–210: Ergonomics of human–system interaction. Part 210: Human centred design for interactive systems. Clausule 2.15.* Ginebra: International Standards Organization.

Inversini, A., Cantoni, L., & De Pietro, M. (2014). Destination online communication: Why less is sometimes more. A study of online communications of English destinations. *Journal of Travel & Tourism Marketing, 31*(5), 563–575. https://doi.org/10.1080/

10548408.2014.883949.

Karvonen, K. (2000). The beauty of simplicity. *CUU'00 proceedings on the 2000 conference on universal usability* (pp. 85–90). . https://doi.org/10.1145/355460.355478 Arlington, VA, USA.

Kim, J., Lee, J., & Choi, D. (2003). Designing emotionally evocative homepages: An empirical study of the quantitative relations between design factors and emotional dimensions. *International Journal of Human-Computer Studies, 59*(6), 899–940. https://doi.org/10.1016/j.ijhcs.2003.06.002.

Krippendorff, K. H. (2013). *Content analysis: An introduction to its methodology* (3rd ed.). Thousand Oaks: SAGE Publications, Inc.

Lavie, T., & Tractinsky, N. (2004). Assessing dimensions of perceived visual aesthetics of web sites. *International Journal of Human-Computer Studies, 60*(3), 269–298. https://doi.org/10.1016/j.ijhcs.2003.09.002.

Law, R., Qi, S., & Buhalis, D. (2010). Progress in tourism management: A review of website evaluation in tourism research. *Tourism Management, 31*(3), 297–313. https://doi.org/10.1016/j.tourman.2009.11.007.

Lee, W., & Gretzel, U. (2012). Designing persuasive destination websites: A mental imagery processing perspective. *Tourism Management, 33*(5), 1270–1280. https://doi.org/10.1016/j.tourman.2011.10.012.

Li, S. C. H., Robinson, P., & Oriade, A. (2017). Destination marketing: The use of technology since the millennium. *Journal of Destination Marketing & Management, 6*(2), 95–102. https://doi.org/10.1016/j.jdmm.2017.04.008.

Li, X., & Wang, Y. (2011). Measuring the effectiveness of US official state tourism websites. *Journal of Vacation Marketing, 17*(4), 287–302. https://doi.org/10.1177/1356766711423436.

Lindgaard, G., & Dudek, C. (2003). What is this evasive beast we call user satisfaction? *Interacting with Computers, 15*(3), 429–452. https://doi.org/10.1016/S0953-5438(02)00063-2.

Lu, Z., Lu, J., & Zhang, C. (2002). Website development and evaluation in the Chinese tourism industry. *Networks and Communication Studies, 16*(3–4), 191–208. Retrieved from http://www.netcom-journal.com/index.html.

Luna-Nevarez, C., & Hyman, M. R. (2012). Common practices in destination website design. *Journal of Destination Marketing & Management, 1*(1–2), 94–106. https://doi.org/10.1016/j.jdmm.2012.08.002.

Martínez-Sala, A. M. (2015). *Calidad de websites turísticas oficiales de la costa mediterránea española (2004–2015).* (Tesis doctoral).

Martínez-Sala, A. M. (2018). Marketing 2.0 applied to the tourism sector: The commercial function of the websites of destination marketing organization. *Vivat Academia.Revista de Comunicación, 143*, 01–23. https://doi.org/10.15178/va.2018.143.01-23.

Mich, L., Franch, M., & Martini, U. (2005). A modular approach to quality evaluation of tourist destination web sites: The quality model factory. In A. J. Frew (Ed.). *Information and communication technologies in tourism 2005: Proceedings of the international conference in Innsbruck, Austria 2005* (pp. 555–565). New York: Springer Vienna. https://doi.org/10.1007/3-211-27283-6_50.

Míguez González, M. I., & Fernández-Cavia, J. (2015). Tourism and online communication: Interactivity and social web in official destination websites. *Communications Society, 28*(4), 17–30. Retrieved from http://www.unav.es/fcom/communication-society/es/articulo.php?art_id=545.

Minghetti, V., & Buhalis, D. (2010). Digital divide in tourism. *Journal of Travel Research, 49*(3), 267–281. https://doi.org/10.1177/0047287509346843.

Morrison, A. M., Taylor, J. S., & Douglas, A. (2004). Website evaluation in tourism and hospitality. *Journal of Travel & Tourism Marketing, 17*(2–3), 233–251. https://doi.org/10.1300/J073v17n02_18.

Nafría, I. (2008). *Web 2.0. El usuario, el nuevo rey de internet* (4th ed.). Barcelona: Gestión2000.

Nielsen, J. (1993). *Usability engineering.* Boston: Academic Press.

Nielsen, J. (1995). 10 usability heuristics for user interface design. *Useit.com Jacob Nielsen´s Website. Papers and essays*. Retrieved from http://www.useit.com/papers/heuristic/heuristic_list.html.

Nielsen, J. (1999). *Designing web usability. The practice of simplicity.* Indiana: New Riders Publishing.

Nielsen, J. (2000). *Usabilidad. Diseño de sitios Web.* Madrid: Prentice Hall.

Nielsen, J. (2010). Scrolling and attention. *Nngroup.com NN/g Nielsen Norman Group. Articles.* Retrieved from http://www.nngroup.com/articles/scrolling-and-attention/.

Önder, I., & Marchiori, E. (2017). A comparison of pre-visit beliefs and projected visual images of destinations. *Tourism Management Perspectives, 21*, 42–53. https://doi.org/10.1016/j.tmp.2016.11.003.

Park, Y. A., & Gretzel, U. (2007). Success factors for destination marketing web sites: A qualitative meta-analysis. *Journal of Travel Research, 46*(1), 46–63. https://doi.org/10.1177/0047287507302381.

Paz, F., Paz, F. A., Arenas, J. J., & Rosas, C. (2018). A perception study of a new set of usability heuristics for transactional web sites. In W. Karwowski, & T. Ahram (Eds.). *Intelligent human systems integration. IHSI 2018. Advances in intelligent systems and computing* (pp. 620–625). Cham: Springer International Publishing AG. https://doi.org/10.1007/978-3-319-73888-8_96.

Peña Sánchez de Rivera, D. (2002). *Regresión y diseño de experimentos.* Madrid: Alianza.

Pereira, R., & Baranauskas, M. C. C. (2015). A value-oriented and culturally informed approach to the design of interactive systems. *International Journal of Human-Computer Studies, 80*, 66–82. https://doi.org/10.1016/j.ijhcs.2015.04.001.

Pérez Curiel, C., & Luque Ortiz, S. (2018). Fashion influence marketing. Study of the new model of consumption in Instagram of university millennials. *adComunica Revista Científica de Estrategias, Tendencias e Innovación en Comunicación, 15*, 255–281. https://doi.org/10.6035/2174-0992.2018.15.13.

Petrie, H., & Bevan, N. (2009). In S. Constantine (Ed.). *The evaluation of accessibility, usability and user experience* (pp. 20–1-20-14). Boca Raton: CRC Press. Taylor & Francis Group. https://doi.org/10.1201/9781420064995-c20 The universal access handbook.

Qi, S., Law, R., & Buhalis, D. (2008). Usability of Chinese destination management organization websites. *Journal of Travel & Tourism Marketing, 25*(2), 182–198. https://doi.org/10.1080/10548400802402933.

Qi, S., Leung, R., Law, R., & Buhalis, D. (2008). A study of information richness and downloading time for hotel websites in Hong Kong. In P. O'Connor, H. Wolfram, & U. Gretzel (Eds.). *Information and communication technologies in tourism 2008: Proceedings of the international conference in Innsbruck, Austria 2008* (pp. 267–278). New York: Springer Vienna. https://doi.org/10.1007/978-3-211-77280-5_24.

Rodríguez-Molina, M. A., Frías-Jamilena, D. M., & Castañeda-García, J. A. (2015). The contribution of website design to the generation of tourist destination image: The moderating effect of involvement. *Tourism Management, 47*, 303–317. https://doi.org/10.1016/j.tourman.2014.10.001 (Supplement C).

Schmidt, S., Cantallops, A. S., & dos Santos, C. P. (2008). The characteristics of hotel websites and their implications for website effectiveness. *International Journal of Hospitality Management, 27*(4), 504–516. https://doi.org/10.1016/j.ijhm.2007.08.002.

Senecal, S., & Nantel, J. (2004). The influence of online product recommendations on consumers' online choices. *Journal of Retailing, 80*(2), 159–169. https://doi.org/10.1016/j.jretai.2004.04.001.

Shackel, B. (1991). Usability—Context, framework, definition, design and evaluation. In B. Shackel, & S. J. Richardson (Eds.). *Human factors for informatics usability* (pp. 21–37). New York: Cambridge University Press New York.

Sharkie, C., & Fisher, A. (2013). *Jum start responsive web design.* Australia: SitePoint Pty. Ltd.

Skadberg, Y. X., & Kimmel, J. R. (2004). Visitors' flow experience while browsing a web site: Its measurement, contributing factors and consequences. *Computers in Human Behavior, 20*(3), 403–422. https://doi.org/10.1016/S0747-5632(03)00050-5.

Tan, F. B., & Tung, L. L. (2003). Exploring website evaluation criteria using the repertory grid technique: A web designers' perspective. *Proceedings of the Second Annual Workshop on HCI Research in MIS, Seattle, WA* (pp. 65–69). Seattle, WA.

Tierney, P. (2000). Internet-based evaluation of tourism web site effectiveness: Methodological issues and survey results. *Journal of Travel Research, 39*(2), 212–219. https://doi.org/10.1177/004728750003900211.

Tractinsky, N., Katz, A. S., & Ikar, D. (2000). What is beautiful is usable. *Interacting with Computers, 13*(2), 127–145. https://doi.org/10.1016/S0953-5438(00)00031-X.

Túñez-López, M., Altamirano, V., & Valarezo, K. P. (2016). Collaborative tourism communication 2.0: Promotion, advertising and interactivity in government tourism websites in Latin America. [Comunicación turística colaborativa 2.0: Promoción, difusión e interactividad en las webs gubernamentales de Iberoamérica]. *Revista Latina de Comunicación Social, 71*, 249–271. https://doi.org/10.4185/RLCS-2016-1094.

Vladimirov, Z. (2012). Customer satisfaction with the Bulgarian tour operators and tour agencies' websites. *Tourism Management Perspectives, 4*, 176–184. https://doi.org/10.1016/j.tmp.2012.07.003.

Wang, F., Head, M., & Archer, N. (2000). A relationship-building model for the Web retail marketplace. *Internet Research, 10*(5), 374–384. https://doi.org/10.1108/10662240010349381.

Yeung, T. A., & Law, R. (2006). Evaluation of usability: A study of hotel web sites in Hong Kong. *Journal of Hospitality and Tourism Research, 30*(4), 452–473. https://doi.org/10.1177/1096348006290115.

Zhou, Q., & DeSantis, R. (2005). Usability issues in city tourism website design: A content analysis. *Proceedings of 2005 IEEE international professional communication conference* (pp. 789–796). Piscataway, NJ: Institute of Electrical and Electronics Engineers. https://doi.org/10.1109/IPCC.2005.1494253.

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