Electronic Journal of Applied Statistical Analysis
EJASA, Electron. J. App. Stat. Anal.
http://siba-ese.unisalento.it/index.php/ejasa/index
e-ISSN: 2070-5948
DOI: 10.1285/i20705948v12n1p108

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Published: 26 April 2019

Electronic Journal of Applied Statistical Analysis
Vol. 12, Issue 01, April 2019, 108-139
DOI: 10.1285/i20705948v12n1p108

Online promotion of UNESCO heritage sites in Southern Europe: website information content and managerial implications

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Published: 26 April 2019

Specific and Destination Websites of UNESCO Heritage Sites (WUHS) located in France, Italy and Spain are analyzed to investigate if the management of UNESCO is able to promote heritages efficiently in the World Wide Web. Empirical evidence supports the idea that WUHS ranking depends on the type and localization of the site and the quantity and quality of WUHS information influences the time spent by a user visiting a website-page. Therefore, managers could be able to improve the role of websites through: a) a more efficient and incisive promotion of a site or a destination; b) a WUHS design based on target markets' needs and the type of information that markets perceive as useful. An "adequate" WUHS is thus intended as a virtual place where tourists can find all the relevant information.

keywords: Website quality, Online Promotion, Natural and Cultural Heritage, UNESCO, ANOVA, Regression Trunk.

1 Introduction

Numerous researchers have analyzed the phenomenon world heritage by UNESCO and focused on different themes. For instance, some studies have investigated the relation between the stakeholders' power and the designation process, e.g.: Williams (2005),

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ISSN: 2070-5948
http://siba-ese.unisalento.it/index.php/ejasa/index

and Smith (2006); the effect of the designation in consideration of development and preservation of heritage, e.g. Wang (2007); the reasons for the designation and the perceived advantages and disadvantages to the stakeholders involved, e.g.: Richards and Munsters (2010) and Patuelli et al. (2013). In the same framework, an important study (Bové-Sans and Laguado-Ramírez, 2013) has explained how to exploit a World Heritage Site (WHS) for tourism, supporting the idea of enforcing policies of promotion and communication to raise awareness about destination and cultural and environmental resources.

In this paper, the focus is on WHS and on a specific communication tool: the website. The quantity and quality of information available in Websites of cultural and environmental sites of UNESCO Heritage Sites is analyzed. Hereinafter, these websites are denoted with WUHS. Specifically, the present study is motivated by the purpose of understanding how the cultural and natural sites declared Word Heritage of UNESCO and located in three Mediterranean countries use the World Wide Web (WWW) to promote their services and activities and to offer information about the heritage.

Specifically, the research has three objectives:

1. to evaluate differences among countries and/or types of WUHS (specific ones and official destination ones) w.r.t. each observed characteristic of the website as well as to some website performance metrics;

2. to find relevant variables that mostly contribute to increase the ranking of a WUHS and that affect the average time spent by a user on each individual page;

3. to verify if the results obtained for all the observed WUHS are still valid when the analysis is limited to the most popular WUHS only.

For these aims to be accomplished data from 142 WUHS concerning all sites included in the World Heritage List (WHL) and located in France, Italy and Spain have been collected.

In summary, results highlight relevant differences among countries and between Specific WUHS and Destination WUHS and provide evidence that the online success of UNESCO heritages is linked with the presence of specific information.

The remainder of the paper is organized as follows. Contribution to the research and related literature are presented in Section 2, while the research design is described in Section 3 where information about data collection (Sec. 3.1) and the research method (Sec. 3.2) are also reported. Section 4 presents results of the analysis that lead to the critical discussion of the main research findings and managerial implications in Section 5.

2 Literature Review and Contribution to the Research

It is well documented that culture and environment represent important forces to attract tourists and, recently, demographic, social, and cultural changes determined a rise of culture tourist flows (Richards, 1996; Ismail, Masron and Ahmad; Dallen, 2014; Liu,

2015). In view of that, cultural tourism is important because of its positive economic and social impact and the changes in the seasonal tourism flows it can induce, in this way reinforcing cultural identity and supporting preservation of heritage (Li and Wang, 2011; Pop, 2016).

Two different elements favour the relevance and the adequate development of cultural tourism. The first is sustainability: the economic and social development of a destination should be sustainable (World Heritage Committee, 2002, p. 6) in terms of environmental protection, economic growth and social equity (Lu and Nepal, 2009; Lozano-Oyola et al., 2012; Wijesuriya et al., 2013; Barrutia and Echebarria, 2015; Bhuiyan, Siwar and Ismail). The second is management and promotion: managing cultural heritage sites is not trivial, as it is necessary to consider different elements, like the value of resources, the necessity to preserve them, the local community involvement, the visitors' and tourists' needs and the correct way to facilitate each form of sustainable development of tourism. Thus, sustainability and managerial skills represent important elements for the correct management of cultural heritages that have to be supported by appropriate communication strategies. Among them, online communication plays a major role and the website is among the main tools causing a destination to be successful.

As for the specific case of World Heritage Sites, it is worth highlighting that sites included in WHL are often the main destinations of cultural tourism. They get a lot of benefits: an increase of honor and prestige of the destination; a strengthening of protection and management system of the site; an increase in financial influx (Poria et al., 2011; Li et al., 2016); an increase of tourism flows (Jimura, 2011); a positive effect of WHS on tourism performance (Su and Lin, 2014; Patuelli et al., 2013), although it was recently argued that it is preferable to measure this effect locally (Ribaudo and Figini, 2017). At the same time, the assumption that the mere inscription of a site or a destination on the WHL automatically results in increased visitation levels is naïve and overly simplifies the nature of visitor trend at WHS (Fyall and Rakic, 2006). Thus, designation per se may not be a panacea that will bring in more visitors (Poria et al., 2011). These different opinions about the relation between WHS designation and tourism performance of a destination confirm the feature of double-edged sword of the WHS designation (Bandarin, 2005) and supports the idea that, to transform the WHS listing into a competitive advantage for the hospitality system, it is necessary to enforce the bundle of promotional, marketing, cultural, and tourism policies implemented by the destination management (Cuccia, 2012).

Taking all the above-mentioned considerations into account, the present study is aimed at enhance previous literature investigating whether an appropriate promotion of the heritage site provides a relevant increase in the appreciation of a tourist destination and, more specifically, if online (website) promotion is a key factor for a destination to be successful. Thus, the main motivation supporting this research is the assessment of the importance of the website as a communication and promotion tool for the management of heritage sites of UNESCO. Since World Wide Web offers a lot of potentiality for business (Luduenã et al., 2013), this research is orientated towards understanding whether sites declared heritage of UNESCO efficiently use website to promote their heritage, give general information and tourism information, engage possible tourists in a virtual

experience that can attract an elevate number of visitors.

Our research objective is related to some results presented in the literature:

a) It has been demonstrated that tourist website usefulness is a significant predictor of intent to travel to the destination (Kaplanidou and Vogt, 2006) and that content is the most important characteristic of a tourist website (Jung and Baker, 1998; Perdue, 2001; Jeong and Choi, 2004). We investigate about the possibility of extending these results to WUHS.

b) Results reported Poria et al. (2004) evidence that the links between a site's attributes and tourists are essential to understand tourists' motivations to visit heritage places, as well as that reasons for visiting heritage sites are linked to tourists' perception of the site in relation to their own heritage and their willingness to be exposed to an emotional experience. In view of that, in this study we also assess if a properly organized WUHS contributes relevantly to improve tourists' perception of the site and stimulates their willingness to be subjected to an emotional experience. This is done by analysing the causal relationships between performance metrics of WUHS and variables measuring their specific information content as well as by focusing on the time spent by users when visiting WUHS pages.

c) The profile of tourists has changed in time with the arrival of the Internet. They are not simple consumers: they are "AdProSumer" (Maldonado, 2008). Nowadays, tourists produce their tours: they search information, create their trip and buy online some or all elements before departure. After consuming their vacation they share on the Internet their feedbacks on the destination, becoming advertiser. From most of these steps WWW assumes a critical and important role related to tourism choices (Bastida and Huan, 2014), and it has been documented that websites are becoming the most important and essential places where information can be found and shared, and tours can be planned (Zou and De Santis, 2005; Buhalis and Law, 2008; Inversini, Cantoni and De Pietro; Xiang et al, 2015). For these reasons, we hereby analyse websites' content in order to understand if managerial efforts are orientated towards creating an "adequate" WUHS intended as a virtual place where tourists can find all the relevant information.

d) In the same way, the website becomes an important tool for marketing and communication, a support for business to promote products and services and to generate revenues (Law et al., 2004; Ho, Lin and Chen; Wen, 2012; Ukpabi and Karjaluoto, 2017). Thus, websites are an important tool for promoting tourism destination and also cultural and natural places: "However, not all websites are equally successful" (Bastida and Huan, 2014, p. 168). All websites are different; each of them presents different elements and is constructed in different way. For the specific case of WUHS, we check if websites are effectively designed to attract visitors and to provide information, as well as if a proper communication strategy is used.

e) Website quality is the users' evaluation of whether websites' features meet users' needs and reflect the overall excellence of the website (Chang and Chen, 2008,

p. 821). Our study is aimed at enforcing findings of previous research focusing on "information quality", the first of the three dimensions introduced in DeLone and McLean (2003) and is based on the concern that, in general, perceived website quality is strongly related to website trust (Kim et al., 2011; Filieri, 2015; Wang et al., 2015; Agag and El-Masry, 2017). The importance of website quality is reflected in the appreciation of a tourist destination if an appropriate online promotion of the heritage site is carried out once a high-quality website has been designed and implemented. In view of that, we investigate about factors causing a WUHS to be successful and about relevant geographical or intrinsic characteristics of a WUHS that are able to increase its popularity.

To pursue our research goals we analyse WUHS located in France, Italy and Spain. Beside their geographical proximity, these countries have similar touristic characteristics: many cultural and touristic sites, important and well-know touristic destinations, famous and touristic cities (Paris, Rome, Madrid, etc.), elevated touristic flows, etc.

3 Research design

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) preserves culture and naturalistic heritage sites located in all the 195 members States. It keeps a list of World Heritage Sites, where the most important and beautiful sites in the world are included. UNESCO includes in this list different types of resources (UNESCO, 2015, p. 11), in specific: cultural heritage, natural heritage, mixed cultural and natural heritage, cultural landscape, and movable heritage.

In this paper, we consider the first three kinds of heritage only. It is interesting to underline that there are more cultural heritage sites than natural heritage sites, which represents a little fewer than 20% of properties worldwide. However, most of natural sites are very big in size, and for this reason they cover a much larger geographic area than cultural sites: in general, these sites have Outstanding Universal Value (OUV) and are so important that are recognised as relevant to the whole of humanity (Galland et al., 2016).

Several models for measuring the quality of tourism websites have been presented in literature. Some of them measure the general quality of websites (Essawy, 2006), other focus on specific kinds of websites, for instance Destination websites (Benckendorff and Black, 2000; Choi, Lehto and Morrison). Despite the standard classification of related methods into quantitative and qualitative (Ludueña et al., 2013), it is possible to summarize the different approaches for the analysis of the quality of a website as follows (Ludueña et al., 2013; RuelNovabos et al., 2015):

a) counting methods, used to evaluate a website's performance or to determine its content richness (Ludueña et al., 2013, p. 308);

b) automated methods, that utilise specialized software to record websites usage metrics such as page views, clicks, and bounce rates;

c) numerical computation approaches, which use mathematical or statistical tools to estimate and/or predict the performance of a website;

d) user judgment approaches, that evaluate user's satisfaction or perceptions;

e) combined methods, which join together different approaches at once.

A combined method is used in this study. Counting variables related to specific characteristics of WUHS are computed in order to describe the amount of reported information. These information-content variables are analysed together with some performance metrics of the WUHS in order to investigate about relevant differences in the information content of specific groups of WUHS as well as about causal relations between information-content variables and performance metrics. The latter are intended as measures of the quality of the WUHS perceived by users, thus the present study is comparable to that presented in Bernini et al. (2015).

3.1 Data collection and preparation

Data were manually collected during the period between July and September 2016 from the websites of all the 137 cultural and natural heritages of UNESCO located France, Italy and Spain, which represent the 25% of all-European UNESCO sites. We have noticed that not all heritage sites have a specific website and, at the same time, some heritage sites have more than one website. For this reason, the final sample is composed of 142 WUHSs.

Moreover, in some cases information about the heritage sites is included in the official destination websites. In our view, this is a way to consider and to promote the heritage site as a fundamental element of a destination. Therefore, while creating the dataset the case of an official destination WUHS is separated from that of a specific WUHS. In the following, we refer to "Destination WUHS" for the first case and to "Specific WUHS" for the second.

The dataset is composed of 10 variables describing the specific characteristics of each WUHS and 6 variables related to some of their performance metrics. The first group of variables is composed of 7 numeric variables and three categorical variables. The latter are: *country* where the heritage site is located ("France", Italy" or "Spain"), *type of website* ("Destination" or "Specific") and *type of UNESCO site* ("cultural", "natural" or "both"). As for the numeric variables, following previous studies related to the content of information reported in tourist websites, e.g. Perretta (2014), 78 attributes from a sample of 50 WUHS related to sites located in the three countries were originally collected in order to assess the ability of those attributes in describing the peculiar characteristics of a website. In particular, since the main goal is measuring the ability of the information reported in a WUHS in either attracting web visitors or providing general and touristic information attributes are coded as binary variables assuming value 1 if a specific element is included in the WUHS and zero otherwise. This preliminary analysis showed that some of the investigated information was not available in any of the 50 WUHS composing the sample. Thus, the number of considered attributes was

reduced to 58. These attributes are combined in order to create specific information-content variables for each WUHS that were used in the statistical analysis. The latter were obtained through the counting method.

Both information-content variables and the attributes are listed in Table 1.

Information-content variables concern *contact and support in information research; adequacy of reported information, further divided into 4 groups (brand, tourism, external information and news), relational skills and other information/internal communication.*

Concerning performance metrics of a WUHS, we collect some indicators from Alexa. This company, founded in 1996, offers both a web analytics service for any company that has a website and a digital marketing tool that supports the analysis of website trends. It gives important information about the attractiveness, the success and the Search Engine Optimization (SEO) activities of a website. Marketing companies thus use the information provided by Alexa to evaluate the value of websites. Alexa indicators are among the most popular measures of online traffic (Thakur et al., 2011; Luduenã et al., 2013). Our analysis focuses on the following performance metrics:

- *Global Rank*: the ranking of a WUHS w.r.t. the universe of sites on the web over the past 3 months, calculated using a proprietary methodology that combines a site's estimated average of daily unique visitors and its estimated number of pageviews over the past 3 months (see http://www.alexa.com/about).
- *Rank In*: the ranking of a WUHS in a country over the past 3 months.
- *Age*: the number of years the WUHS exists (ref. 2016).
- *Bounce Rate*: the percentage of visitors that leave the WUHS after visiting only one page.
- *Daily Pageviews per Visitor*: the average number of pages that are seen by visitor per day.
- *Daily Time on Site*: the average time spent by a visitor on the WUHS;
- *Search traffic*: also called "organic search engine traffic", is the percentage of visitors who arrive at a WUHS using search engines.
- *Upstream sites*: the websites visited before visiting a WUHS.

The first two metrics are useful to evaluate if a WUHS is visited and if it achieves success. Moreover, they can be used to compare the results of a WUHS with those of other WUHS. Instead, Bounce Rate, Daily Pageviews per Visitors and Daily Time on Site are useful to measure the WUHS capacity to attract tourists, and to entertain and involve visitors. Search Traffic measures the ability to use keywords properly in order to improve the organic traffic. Finally, the last metric is important to identify the website seen before visiting a WUHS. As an example: if the first upstream site for a cultural Italian heritage website is "google.com", it means that the website is visited by foreign tourist. On the contrary, the website attracts domestic visitors if the upstream site is "google.it".

Type of information	Information content Variable	Attributes (0/1 variables)
Contact and support	Contact and support	Search engine, Site map, Foreign languages, Phone number of information offices, Email address, Links to social networks, Generic application form, App for them mobile devices (phone and tablet)
Adequacy of reported information	Brand	Specific brand, UNESCO's brand, Brand of countries, Additional brand(s)
	Tourism	Download depliant, Page flipper, Gallery images, Video, Web TV, The virtual tour, Tour guides contacts, Webcam live, What to do (activities to be performed), Events calendar, Events calendar with booking facilities, Information for customers with specific needs, Information for owners of animal, Information on how to get, Information on how to move in the destination: bus, car rental, taxi service, Map Of The Area, List of Availability of Accommodation, Availability of Accommodation, Online Booking, Info on What to Eat, Info Shopping: Food And Wine Products, Typical Handmade Products, Commercial Centres, Offers/Last Minute Promotions
	External Information	Links to: Tourists Centre (in Italy for instance S.T.L.), Municipality Sites, Local Organizations, Other Territorial Authorities
	News	Press Release, Press Review, News
Relational Skills	Relational Skills	Pages to Share Experiences and Photos, Blogs, TripAdvisor, Newsletters, Chats, Online Contest
Other Information/Internal Communication	Other Information	Data on Tourist Performance, Information about UNESCO Sites, Information about Regional Policies, News And Press Release, Operator Training Area

Table 1: The set of quantitative variables related to specific characteristics of WUHS

3.2 Research method

As previously stated, the present study is aimed at measuring the ability of the cultural and natural sites declared Word Heritage of UNESCO in using effectively the Internet to promote their services and activities through information about the heritage together with the general and touristic information. The basic idea is that a properly organized website could help visitors to arrange their trip and encourage them to visit the site and the related destination.

The statistical analysis focuses on three research hypotheses. The first one is:

H_1 - "There are relevant differences between Specific WUHS and Destination WUHS located in the three observed countries with respect to the amount of information reported in WUHS and/or to their performance metrics".

To assess H_1, we first evaluate the magnitude of these differences separately for the factors "Country" and "Type of website" by considering the significance of the differences among average values taken by each variable in the single country through the One-way Analysis of Variance (ANOVA) test. Next, we investigate if the joint effect of the two factors is significant through the Two-way ANOVA: in this case, we test if the differences among average values taken by each variable with respect to a specific country and a specific type of website are significant or not. The underlying assumption is that the cultural background and the local promotion and communication practices of the country in which a heritage site is located might influence the organization of a WUHS.

A complementary task of this research is related to the performance of a WUHS. For this task to be accomplished, we resort to statistical modeling to provide empirical evidence about the validity of the second hypothesis:

H_2: "There are specific factors causing a website to be more popular"

To verify H_2 we search for the variables considered as the most suitable, from a statistical perspective, in discriminating between WUHS with higher values of performance metrics from those that are the worst performers. We consider two regression models where the response variable is "Global Rank" and the "Average time (in seconds) spent by a visitor on a single page of the WUHS", respectively. For each model we search for the most predictive covariates as well as for the possible interactions among them. To do that, we estimate for each response variable a Regression Trunk model (Dusseldorp et al., 2010) that allows us to select automatically the variables composing the main effects part of the model and those defining the interaction effects. The reason for choosing the regression trunk model is that this approach is completely data-driven and not model-driven. The regression trunk model is able to search automatically threshold interactions among predictors. Despite standard linear model with cross-product interaction terms, the regression trunk is flexible, since it is able to capture automatically the effect of possible nonlinear relationships in the data though piecewise linear functions that specify threshold interaction effects of any type and order. In linear models, instead, the search

of cross-product interactions could be demanding since it has to be pursued by manually searching all the possible interactions and including in the model the significant ones only. The Regression Trunk model is based on the Simultaneous Threshold Interactions Algorithm (STIMA) that integrates generalized linear models with tree-based models and usually defines a small tree structure in the data, called "trunk", which allows us to identify the patterns defining interactions in the data. These are expressed in terms of production rules (i.e., for example: $(x_1 \leq a) \cap (x_2 \leq b)$; where x_1 and x_2 are two covariates, and a and b are two specific values they could take). Model fitting works by first growing the full regression trunk composed of the main effects part and the threshold interaction effects part that are estimated simultaneously, and then by pruning it to avoid data overfitting. Threshold interaction terms are related to specific multidimensional regions of the predictor space that are denoted with $R_i (i = 1, ..., k)$, where k is the number of the estimated interaction term. Each R_i corresponds to a data pattern describing a specific threshold interaction effect. Thus, the interpretation of the threshold interaction terms is facilitated by the analysis of the tree structure, the so-called trunk, and the effect of these terms on the response can be measured in a statistical sense by the t-test evaluating the significance of the associated regression coefficients. To save space, all the technicalities related to estimation and selection of the regression trunk model are explained in Section 3.3 when presenting the results. For a complete description of STIMA in the Generalized Linear Modeling (GLM) framework, Dusseldorp et al. (2010) and Conversano and Dusseldorp (2017).

Finally, the attention is focused on ranks by investigating their distribution among different countries or different types of WUHS. In particular, an additional analysis is performed on the WUHS considered as the 30 top performers (in terms of ranks and time spent by a visitor on the website) in each country and check if the results of the statistical analysis, particularly the Regression Trunk model, are appropriate or not for this group of WUHS. Thus, the third hypothesis is:

H_3 - "The relevant differences between Specific WUHS and Destination WUHS located in the three observed countries (H_1) and the influence of specific factors on popular WUHS (H_2) are still valid if the analysis is restricted to the top performers"

In other words, assessing H_3 allows us to evaluate the consistency of the results obtained from the statistical analysis related to H_1 and H_2.

4 Results

4.1 Descriptive Statistics

Table 2 reports some descriptive statistics of quantitative variables, while the distribution of the type of WUHS among the different countries is represented in Figure 1.

The top-panel of Table 2 refers to the distribution of the website performance metrics. Global Rank and Rank-In are the two metrics presenting more dispersion, since the Alexa engine reports rankings concerning all categories of websites. On average, about

Variable	Min.	Q1	Me	Mean	Q3	Max	Std.dev	n. missing values
Website Performance metrics								
Global Rank/1000	4.92	482.40	1445.59	3117.25	3853.83	27681.74	4365.72	6
Rank In/1000	0.015	7.508	21.54	27.41	43.043	99.142	23.601	72
Bounce Rate	8.30	34.80	42.15	45.12	53.85	95.20	14.77	42
Daily Pageviews per Visitor	1.00	1.92	2.70	2.91	3.50	12.0	1.50	4
Search Traffic	9.50	20.70	26.60	26.67	31.40	60.0	8.40	43
Time on site (in secs.)	54.00	134.00	175.50	199.90	233.50	706.00	105.91	20
Age (in years)	0.08	15.00	19.00	20.31	30.00	37.00	10.11	1
Type of information reported in websites								
Contact and Support	3.00	4.00	5.00	5.46	6.00	10.00	1.51	2
Brand	0.00	1.00	2.00	2.32	3.00	4.00	1.16	2
Tourism	1.00	7.00	10.00	10.49	14.00	21.00	4.87	2
External information	0.00	0.00	1.00	1.81	4.00	4.00	1.93	2
News	0.00	0.75	1.00	0.93	1.00	3.00	0.66	2
Relational skills	0.00	0.00	1.00	1.08	2.00	5.00	1.09	2
Other information	0.00	1.00	1.00	1.46	2.00	6.00	1.78	2

Table 2: Descriptive statistics of the quantitative variables

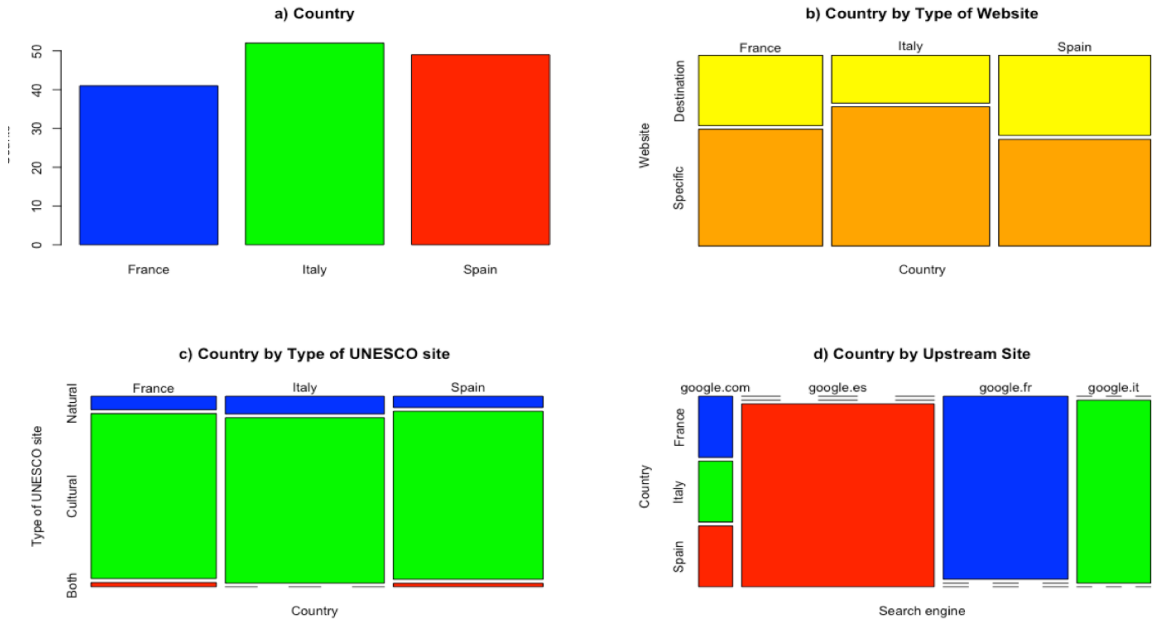

Figure 1: Distribution of WUHS among countries (a), of Country by Type of WUHS (b), of Country by Type of UNESCO site (c) and of Country by Upstream site (d)

45% of the visitors use to leave the WUHS after viewing one page only (mean value of the Bounce Rate is around 45%) and approximately 25% of the visitors arrive at a WUHS from a search engine. Moreover, half of the visitors use to view between 2 and 4 pages of a WUHS each day (according to the value of the 1st and 3rd quartiles of Daily Pageviews per Vistor); for them, the time spent on the WUHS is between 2 and 4 minutes (according to the value of the 1st and 3rd quartiles of Time on site). In general, observed WUHS have not been launched recently, since from half of the WUHS started to work between 15 and 30 years ago (according to the value of the 1st and 3rd quartiles of the variable Age).

The bottom panel of Table 2 summarizes the basic information about the variables related to the specific information content of the WUHS. The distribution of these variables is less dispersed. This is rather intuitive since these variables have been obtained through counting the number of specific features reported in each WUHS. It is possible to notice that the variables Tourism and Contact and Support present higher values on average: this means that those items are more important in characterizing the specificity of both a Destination WUHS and a Specific WUHS.

As for categorical variables, the bar plot summarizing the distribution of the WUHS among the three countries (represented in panel a of Figure 1) shows that this distribution is rather balanced, as the number of WUHS per country equals 41 for France, 52 for

Italy and 49 for Spain. The mosaic plot in panel b) of Figure 1 shows that proportion of Specific WUHS is greater than that of the Destination WUHS in France and Italy, and rather balanced in Spain. If we consider the distribution of the type of UNESCO site in each country (mosaic plot panel c) of Figure 1), we see that in all cases a great proportion of the observed WUHS refers to Cultural sites of UNESCO. Finally, panel d) of Figure 1 provides evidence that most of the visitors arrive to these websites from domestic search engines (for example: "google.it" is used at most to visit Italian websites) while the proportion of arrivals from general search engines like "google.com" is very low and does not derive from the single country.

4.2 Analysis of Variance

Analysis of Variance (ANOVA) is used to assess the validity of H_1 and thus to investigate if the mean values of observed variables show relevant differences with respect to the two factors "Country" and "Type of website" ("Destination" or "Specific"). Particularly, we perform one-way ANOVA to investigate about the differences induced by the geographic area and two-way ANOVA to investigate about the differences induced by both factors. For each experiment, we report the p-value of the overall ANOVA test as well as the p-values deriving from all the possible comparisons between two countries and within countries when considering the factor "type of website". These p-values have been computed by applying the "Tukey's Honest Significant Difference" (HSD) method: see, for example, Yandell (1997). HSD assumes that the variances of the groups are equal. This assumption has been tested using Levene's test, which tests the null hypothesis that the variances of the groups are the same. For all the comparisons the Levene's test statistic was not significant. Thus, the homogeneity of variance assumption of ANOVA was never violated. This result is not surprising, since it is known that ANOVA is fairly robust in terms of the error rate when sample sizes are equal. Panels a) and b) of Figure 1 shows that groups of WUHS have the same size w.r.t. country and type (Destination or Specific).

Results of the ANOVA tests are reported in Table 3 for the variables related to the performance metrics and in Table 4 for the information-content of a WUHS. In both tables, the "Variable by Country" part refers to one-way ANOVA while the "Variable by Country and Type of website" part refers to two-way ANOVA. In the first case, the values on the lower triangular part of each matrix are the p-values deriving from country pairwise comparisons. In the second case, the values on the diagonal are the mean values observed for Destination WUHS and Specific WUHS respectively, while the values on the lower triangular part of each matrix are the p-values deriving from country pairwise comparisons; the "Destination vs. Specific" column reports p-values arising from the comparison, in each country, of the mean value of a variable observed for Destination WUHS with that observed for Specific WUHS.

Table 3 shows that relevant differences among the three observed countries are induced by the variables Global Rank, Daily Pageviews per Visitor and Age (of the website) since, for each variable, the p-value of the ANOVA test is lower than conventional levels. For all these variables significant differences arise when comparing Italy with Spain. On

Variable	One-Way ANOVA: Variable by country					Two-way ANOVA: Variable by Country and Type of website							
						Destination website			Specific website			Dest. vs.	p-value
		FR	IT	SP	p-value	FR	IT	SP	FR	IT	SP	Spec.	2-way Anova
Global	FR	3381			**0.04**	974			4886			**0.06**	0.17
Rank/1000	IT	0.71	4118			0.63	3450		1.00	4366		0.98	
	SP	0.26	**0.03**	1927		1.00	0.79	1542	0.21	0.34	2215	0.99	
Rank	FR	28.52			0.70	34.25			22.27			0.83	0.24
In/1000	IT	0.74	22.57			1.00	32.97		0.95	12.17		0.57	
	SP	0.99	0.70	28.67		0.97	0.99	27.10	0.95	0.54	30.15	1.00	
Bounce	FR	42.74			0.18	40.99			44.60			0.99	0.25
Rate	IT	0.20	49.40			0.65	50.39		0.96	48.94		1.00	
	SP	0.94	0.28	43.94		0.68	1.00	48.43	0.96	0.41	40.39	0.48	
Daily	FR	2.89			**0.01**	3.58			2.46			0.18	0.43
Pageviews	IT	0.41	2.49			0.66	2.75		1.00	2.39		0.97	
per Visitor	SP	0.29	**0.01**	3.36		1.00	0.57	3.60	0.46	0.25	3.19	0.93	
Search	FR	189.50			0.62	215.54			169.9			0.81	0.71
Traffic	IT	0.97	195.30			1.00	199.28		0.97	193.75		1.00	
	SP	0.63	0.76	211.30		1.00	0.96	233.29	0.97	1.00	194.26	0.80	
Time	FR	26.40			0.20	26.51			26.29			1.00	0.81
on site	IT	0.46	29.4			0.97	29.19		0.95	28.97		1.00	
(in secs.)	SP	0.86	0.18	25.37		1.00	0.98	26.75	0.98	0.48	24.27	0.93	
Age	FR	221.38			**0.00**	228.00			217.07			0.01	**0.01**
(in yrs.)	IT	0.21	217.79			**0.06**	217.69		1.00	217.63		1.00	
	SP	0.93	**0.08**	222.12		0.25	0.94	220.81	0.23	0.24	223.11	0.96	

Notes. Variable by Country: the values on the diagonal are the mean values observed for each country; the values on the lower triangular part of each matrix are the p-values deriving from countries pairwise comparisons. Variable by Country and Type of website: the values on the diagonal are the mean values observed for Destination websites and Specific websites respectively; the values on the lower triangular part of each matrix are the p-values deriving from countries pairwise comparisons; the "Destination vs Specific" column reports p-values arising from the comparison, in each county, of the mean values of a variable observed for Destination websites with that observed for Specific websites. P-values lower than 0.10 are reported in bold

Table 3: Analysis of Variance for the website Performance metrics variables

Variable	One-Way ANOVA: Variable by country				Two-way ANOVA: Variable by Country and Type of website							
					Destination website			Specific website			Dest. vs. Spec.	p-value
		FR	IT	SP	p-value	FR	IT	SP	FR	IT	SP		2-way Anova
Contact	FR	6.45			0.00	6.53			6.41			1.00	0.74
and Support	IT	0.00	4.57			0.03	5.01		0.00	4.42		0.75	
	SP	0.01	0.00	5.57		0.44	0.64	6.51	0.11	0.02	5.46	0.99	
Brand	FR	2.40			0.59	2.33			2.44			1.00	0.46
	IT	0.99	2.39			0.97	2.01		1.00	2.53		0.72	
	SP	0.66	0.64	2.18		1.00	0.99	2.24	0.94	0.77	2.14	1.00	
Tourism	FR	12.75			0.00	14.47			11.72			0.38	0.97
	IT	0.00	7.92			0.05	9.77		0.00	7.29		0.48	
	SP	0.29	0.00	11.33		0.92	0.28	13.01	0.73	0.10	10.07	0.18	
External	FR	1.97			0.74	2.13			1.88			1.00	0.35
Information	IT	0.93	1.82			1.00	2.38		1.00	1.63		0.82	
	SP	0.72	0.90	1.65		0.99	1.00	2.48	0.59	0.81	1.03	0.10	
News	FR	1.08			0.04	1.13			1.04			1.00	0.70
	IT	0.05	0.75			0.96	0.92		0.29	0.68		0.87	
	SP	0.85	0.13	1.00		0.99	1.00	1.00	1.00	0.39	1.00	1.00	
Relational	FR	1.25			0.00	1.27			1.24			1.00	0.91
Skills	IT	0.01	0.61			0.44	0.54		0.21	0.63		1.00	
	SP	0.70	0.00	1.43		1.00	0.26	1.33	0.94	0.01	1.50	0.99	
Other	FR	1.60			0.09	1.53			1.64			1.00	0.64
information	IT	0.20	1.17			1.00	1.38		0.49	1.11		0.98	
	SP	0.98	0.11	1.65		0.96	0.86	1.86	1.00	0.75	1.50	0.90	

Notes. Variable by Country: the values on the diagonal are the mean values observed for each country; the values on the lower triangular part of each matrix are the p-values deriving from countries pairwise comparisons. Variable by Country and Type of website: the values on the diagonal are the mean values observed for Destination websites and Specific websites respectively; the values on the lower triangular part of each matrix are the p-values deriving from countries pairwise comparisons; the "Destination vs Specific" column reports p-values arising from the comparison, in each county, of the mean values of a variable observed for Destination websites with that observed for Specific websites. P-values lower than 0.10 are reported in bold.

Table 4: Analysis of Variance for the variables concerning the type of information reported in WUHS

average, Spanish (Italian) WUHS are ranked better (worse), are the most (less) visited in terms of Daily Pageviews and are those created at first (more recently). The two-way ANOVA test shows relevant differences induced by the joint effect of country and type of website for the variable "Age" only. These differences are induced by the following characteristics of observed WUHS: Specific WUHS have been created most recently in France and Italy, but not in Spain, where the average age of Specific WUHS (23.11 years) is higher than that of Destination WUHS (20.81 years); furthermore, the tests about pairwise differences show that a significant difference in Age exists between Destination WUHS located in Italy, where the most recent ones are located, with respect to French Destination WUHS, that result the oldest ones on average. Next, the test about pairwise differences provide evidence about relevant differences in terms of Global Rank between French Destination WUHS with respect to Specific ones: the first are on average ranked significantly better than the second.

Moving to variables concerning type of information reported in a WUHS (Table 4), relevant differences among the three observed countries are induced by the variables Contact and Support, Tourism, News, Relational Skills and Other Information, since the p-value of the ANOVA test is lower than conventional levels. For all these variables, significant differences arise form pairwise comparisons between countries. On average, French (Italian) WUHS are the more (the less) complete w.r.t. Contact and Support, Tourism and News. As for Relational Skills and Other information, Spanish WUHS are those reporting more information. The two-way ANOVA test does not show relevant differences induced by the joint effect of country and type of website. Tests about pairwise comparisons within categories of WUHS show that significant differences exist in the amount of information concerning Contact and Support and Tourism between Destination WUHS located in Italy and those located in France: the information contained in Italian WUHS is significantly lower than that reported in French WUHS. The same result emerges if we consider Specific WUHS of the two countries. For this type of WUHS, important differences arise between Italy and Spain when comparing the amount of information concerning Contact and Support, Tourism and Relational Skills. Again, the content of related information in Italian WUHS appears as significantly condensed compared to that reported in Spanish WUHS. Finally, the within-country tests provide evidence about relevant differences in the amount of External Information existing between Spanish Destination WUHS with respect to Specific ones: the first contains more external information than the second (p.value = 0.10).

Combining the outcome of the different ANOVA tests allows us to assess H_1 by arguing that relevant differences exist between Specific WUHS and Destination WUHS located in the three observed countries: Spanish WUHS are those created less recently but, at the same time, they are ranked higher on average, followed by French ones. Italy is late in reporting information for tourists. In addition, in all countries Destination WUHS are ranked higher than Specific ones, although the difference is significant for the Spanish case only. The content of reported information is significantly higher in France w.r.t. the majority of the observed variables; contrariwise, Italy has the less completed WUHS. Spain is in an intermediate position, although average values of the quantities of reported information are more similar to those of French WUHS.

4.3 Regression Trunk models outcome

The findings deriving from one-way and two-way ANOVA indicate that the variables country of origin and type of website (Destination or Specific) could play an important role in determining different levels of the other variables, either those related to specific information reported in a WUHS or to its performance metrics. As for the latter, ANOVA shows that country and type of website can induce, separately or jointly, a significant variation into the performance metrics Global Rank and Daily Pageviews per Visitor. To further investigate this issue, as well as to investigate about the truthfulness of H_2, a regression trunk model is estimated by firstly considering how observed variables affect the Global Rank of a WUHS. Next, the attention is focused on determining which are the variables influencing the average time spent by a visitor on a WUHS.

Preliminarily, we notice that the distribution of some of the observed variables is characterized by a relevant number of missing values (see Table 2). To mitigate the effect of missing values, we decide to discard observations presenting more than 3 missing values and variables presenting more than 20 missingness. In view of these exclusions, the size of the dataset is reduced to $n = 119$ from the original size of $n = 142$, and the variables Rank In, Bounce Rate and Search Traffic are not used in model fitting.

Following the standard procedure used in this framework[1], the regression trunk (tree structure) is grown on this data by applying 10-fold cross-validation, and the final (selected) trunk model is the one inducing the largest increase in the effect size deriving from the inclusion in the model of an additional threshold interaction term to both its main effects part and the previously included interaction terms.

As mentioned above, the first regression trunk model is estimated by considering the Global Rank as response variable. Global Rank is a number expressing the rank of a website provided by Alexa: lowest value of this variable means highest rank, and vice versa. Before estimating the model, the response variable is set to $-\log(GlobalRank)$, in order to obtain regression coefficients whose sign directly reflects the influence on ranks as well as to mitigate the effect of outliers.

The estimated regression trunk model is represented in Figure 2. A significant threshold interaction is induced by the joint effect of the variables Country and Daily Pageviews. It allows us to distinguish among 4 regions of the predictor space. The first one is that containing 13 WUHS located in Spain and characterized by more than 3.7 Daily Pageviews per visitor (R_1): this group of WUHS corresponds to the best-ranked WUHS since the mean value of the response variable in R_1 is the highest one (-12.44) compared to the other three regions. The second-best ranked group of WUHS includes the 34 WUHS located in France (R_2), while the third group is composed of 35 Spanish WUHS having a number of Daily Pageviews lower than 3.7 on average (R_3). Finally, the worst ranked group of WUHS is composed of the 35 WUHS located in Italy (R_4).

Table 5 summarizes the outcome of the estimated regression model deriving from the trunk represented in Figure 3. Values of the regression coefficients provide evidence about the influence of variables included in both the main effects part and the interaction

[1] For details, see Dusseldorp et al. (2010).

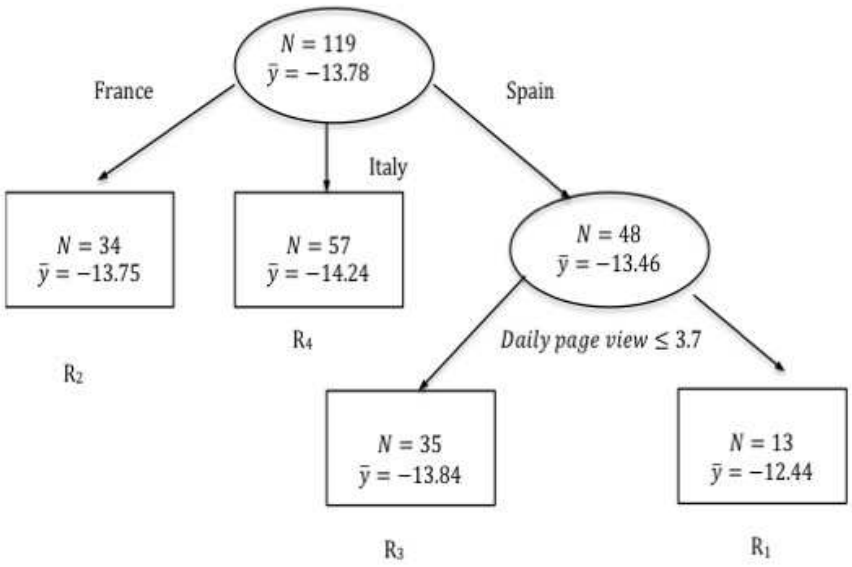

Figure 2: Pruned regression trunk obtained from the model measuring the influence of observed variables on Global Rank: the response variable is $-log(GlobalRank)$

Variable	Estimated coefficient	Standard Error	t value	p-value
Intercept	-14.35	0.75	-19.23	0.00
Tourism	0.14	0.03	4.89	0.00
External Information	-0.14	0.06	-2.32	0.02
Age (in yrs.)	0.03	0.01	2.50	0.01
Brand	-0.20	0.10	-2.05	0.04
Daily Pageviews per Visitor	-0.11	0.09	-1.19	0.24
Contact and Support	0.18	0.09	2.05	0.04
Type of website	0.12	0.24	0.49	0.62
News	0.12	0.18	0.67	0.51
Other	-0.06	0.11	-0.58	0.57
R_2	-1.51	0.44	-3.39	0.00
R_3	-1.91	0.46	-4.10	0.00
R_4	-2.05	0.45	-4.58	0.00
Residual standard error: 1.141, degrees of freedom: 106				
Adjusted R-squared: 0.3496				
F-statistic: 6.285, p-value: 0.00				

Table 5: Estimated regression trunk model for the assessment of the influence of observed variables on Global Rank: the response variable is -log(Global Rank)

effects part of the model on the response[2]. The p-values resulting from the t-test on individual coefficients that are lower than conventional levels (highlighted in bold) allow us to identify the factors having a significant influence on the Global Rank. The sign of the estimated coefficient informs about the direction of the influence: a positive sign means that increasing the value of a specific variable causes an increase in the Global Rank, and vice versa. From Table 5, it is possible to notice that the variables Tourism, Contact and Support, and Age have a relevant positive effect on Global Rank, while External Information and Brand have a negative effect. The importance of tourism information supports the results obtained by the Travel Industry Association of America (TIA, 2004) for tourism websites, where it is reported that most popular types of online travel planning involve map searches, things to do, entertainments, local events, etc.

Moving to the interpretation of the threshold interaction effects, since the trunk identifies 4 disjoint regions of the predictor space it is necessary that one of them is used as reference category in order to avoid misspecification and facilitate the interpretation of

[2]We have estimated the standard linear regression model with the same model specifications and possible cross-product interactions on the same data. Results, not reported to save space, do not point out significant interactions.

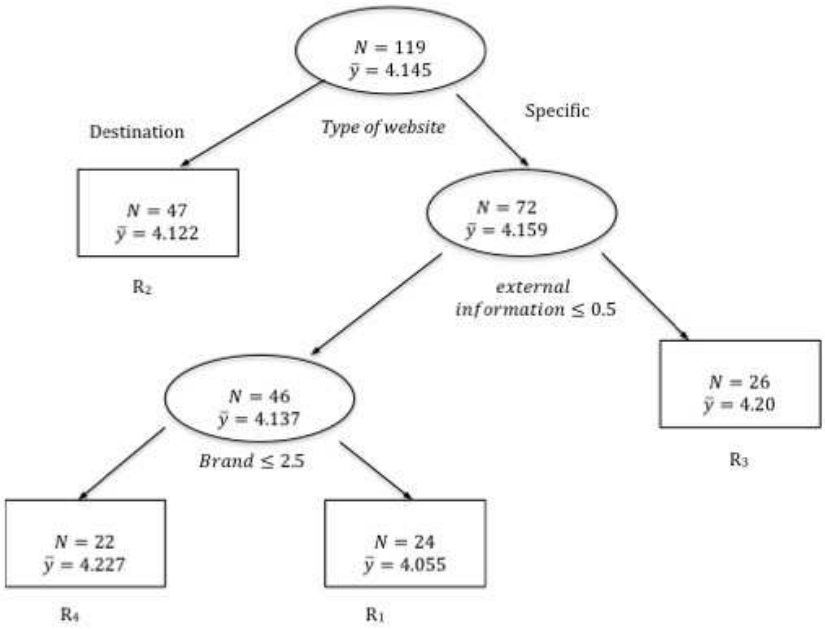

Figure 3: Pruned regression trunk obtained from the model measuring the influence of observed variables on $AverageTimeperPage$

results. In this respect, we decide to choose R_1 as reference category since the possible negative value of regression coefficients associated to the remaining three terms allows us to graduate the decrease in Global Rank caused by ideally moving from one region to another or, in other terms, the marginal effect associated to each coefficient of a threshold interaction term. As a result, all the regression coefficients associated to R_2, R_3 and R_4 are negative and significant. In particular, these results provide evidence that the lowest decrease in Global Rank is that induced by moving from a Spanish WUHS having more than 3.7 Daily Pageviews to French WUHS located in R_2, since the R_2 coefficient (-1.51) is the lowest one. Contrariwise, the largest decrease in Global Rank is that induced by Italian WUHS located in R_4 (-2.05).

The regression trunk obtained from the second model is represented in Figure 3. In this case, the response variable is the "Daily average time (in seconds) spent by a visitor on a website page", obtained by dividing the "Time on Site" variable by the "Daily Pageview per visitor" one. We consider logarithmic transformation of this ratio in order to mitigate the possible influence of outliers as well. Figure 3 shows that a significant threshold interaction is induced by the joint effect of the variables Type of Website, External Information and Brand which allows us to distinguish among four regions of the predictor space. The variable type of website induces the first split of the trunk:

Variable	Estimated coefficient	Standard Error	t value	p-value
Intercept	-3.87	0.18	21.84	0.00
Tourism	-0.01	0.01	-0.90	0.36
External Information	-0.05	0.02	-2.12	0.04
Age (in yrs.)	0.01	0.01	2.14	0.03
Brand	0.06	0.03	1.86	0.07
Contact and Support	-0.03	0.02	-1.43	0.15
Country = "France"	-0.02	0.07	-0.24	0.81
Country = "Spain"	0.09	0.07	1.27	0.21
News	-0.04	0.05	-0.74	0.46
Other	0.06	0.03	2.29	0.02
R_2	0.29	0.10	2.79	0.00
R_3	0.43	0.13	3.29	0.00
R_4	0.31	0.11	2.83	0.00
Residual standard error: 0.2997, degrees of freedom: 106				
Adjusted R-squared: 0.1996				
F-statistic: 2.088, p-value: 0.02				

Table 6: Estimated regression trunk model for the assessment of the influence of observed variables on Average Time per Page

Specific WUHS are further partitioned into 3 groups (R_1, R_3 and R_4) according to values of the variables External Information and Brand. We can see that these two variables are inversely related to time spent by a visitor on a page of a Specific WUHS, since the most visited group of Specific WUHS in terms of average time spent on the website in a day are those characterized by a value of the External Information variable lower than 0.5 and a value of the Brand variable lower than 2.5 (R_4). Increasing the amount of External Information causes a decrease in time spent on a Specific WUHS for observations belonging to R_3, as the mean value of the response variable decreases from about 4.23 in R_4 to 4.20 in R_3. An additional decrease in time spent on a website is registered for Specific WUHS characterized by a value of External Information lower than 0.5 but a value of Brand higher than 2.5 (R_1). Instead, time spent on visiting a Destination WUHS is on average rather low, since the mean value of the response variable for this category of WUHS (located in the region R_2 of the regression trunk) is 4.122.

The outcome of the estimated regression model deriving from the regression trunk, represented in Figure 4, is summarized in Table 6. In this case, the sign of the estimated coefficient has a direct influence on the response variable: a positive sign means that

increasing the value of a specific variable causes an increase in Daily average time per page, and vice versa. Results provide evidence about the positive effect on the response of the variables Age, Brand and Other Information, while External Information has a negative effect. Interestingly, in this case it is worth to notice that variables External Information and Brand respectively have a negative and positive effect on the response if considered individually in the main effects part of the model. Rather, their joint effect induces a positive change in the response variable as documented by the value of the estimated coefficients obtained for the threshold interaction terms. To further highlight this effect, we decide to choose R_1 as reference category since the possible positive value of regression coefficients associated to the remaining three terms allows us to graduate the increase in Daily average time per page caused by the marginal effect of each variable defining a threshold interaction term. As a result, all the regression coefficients associated to R_2, R_3 and R_4 are positive and significant. In particular, the highest increase in Daily average time per page is that induced by Specific WUHS characterized by a considerable amount of External Information (the coefficient associated to R_3 is 0.43). Inversely, the lowest decrease in Daily average time per page is that induced by Destination WUHS located in R_2 (regression coefficient is 0.29). An intermediate marginal effect is obtained for Specific WUHS with less External Information and less information about Brand (i.e., the region R_4, whose regression coefficient is 0.31).

Summarizing, results of the regression trunk analysis provide evidence about the variables, and the interactions among them, influencing the Global Rank of a WUHS and the Daily average time spent on WUHS pages. As for H_2, it might be argued that the variables Country and Dailypageviews allows us to detect a group of Spanish WUHS with less than 4 pages visited per day that results the top-ranked group; for these WUHS in particular, but for all websites in general, the amount of touristic and contact-and-support information has a positive effect on the global rank. The same effect is caused by the variable Age (WUHS created at first are, on average, those performing better) while the opposite effect is caused by external information and the presence of different brands in the homepage. As for the time spent in visiting a WUHS page, Specific WUHS are those where a visitor spent more time on average. For this category of WUHS, increasing the amount of external information causes an increase in the time spent on a webpage for Specific WUHS, which are exposed to the same effect if there are not many brands in their homepage. Instead, if one focuses on all the observed WUHS a positive effect on the time spent visiting a page is caused by other information and by the presence of brands. Contrariwise, touristic and external information cause a reduction in the average time spent in visiting a page: this effect might be considered as positive, since it is very likely that a visitor is able to find immediately the required information. In a roundabout way, this immediateness in the availability of touristic information has a positive effect on the ranking of the WUHS, since the variables Global Rank and Tourism are positively correlated. All these findings support the study of Kaplanidou and Vogt (2006), which documents that length of Internet use in terms of hours spent on the Internet per week did not influence perceptions of Web site usefulness.

4.4 Focusing on top performers WUHS

Outcomes of the estimated regression trunk models indicate that the variables country of origin and type of website (Destination or Specific) play an important role in determining the popularity of a WUHS. The latter has been investigated, in Section 4.3, with regards to the global rank and the average daily time spent on a website.

In this Section, to verify H_3 results of an experiment based on the selection of a balanced sample containing the best 30 WUHS for each country are presented. The basic idea is to investigate how the proportion of cases per countries varies if one considers the first n WUHS that are the best performers either in terms of global rank or in terms of daily average time spent on site. Thus, this experiment is carried out on a balanced sample of observations. Specifically, original data is divided into 3 subsets depending on the country of origin of WUHS (France, Italy and Spain) and each subset is ordered in an increasing (decreasing) way according to the value of global rank (daily average time spent on site). Next, for each country (subset) the first 30 WUHS are selected and joint together in a new dataset named "ranked balanced sample", composed of WUHS identified as the 30 best-performers per country. Finally, the 90 WUHS composing the "ranked balanced sample" are once again ordered in an increasing (decreasing) way according to the global rank (the daily average time spent on site), in this way obtaining an ordered list of WUHS ranging from the best to the worst performer.

Of course, since the experiment considers two performance metrics (global rank and daily average time spent on site) the analysis is carried out on two distinct ranked balanced samples. For each sample, the interest is in investigating the differences among the proportion of cases belonging to the different countries as well as to the different type of WUHS (Destination or Specific). This investigation is repeated 89 times by varying the size of the ranked balanced sample from 2 to 90. In other words, we are interested in understanding how many WUHS (Destination or Specific) of a specific country are in the group of the top n performers ($n = 2, \ldots .., 90$).

Results of the experiment are summarized in Figure 4.

The left panel refers to the proportion of WUHS belonging to the balanced ranked sample arising from the performance metric "global rank". The plot shows that Spanish WUHS are prevalently the best-performers as well as that Specific WUHS are usually ranked better than Destination ones. Of course, these differences in performance disappear and change direction as long as the size of the ranked balanced sample increases, that is, when moving from left to right in the inspection of the plot. Data from which the plot is generated indicates that, if one focuses on the first 5 (10) top-performers, the proportion of Spanish WUHS is 0.80 (0.50): inside this group, the proportion of Specific WUHS is 0.50 (0.60). Italy is the country with less WUHS, since it has no websites in the group of the 5 best performers and two websites only in the group of the 10 best-performers. Likewise, focusing on the first 25 (50) top-performers, the proportion of Spanish WUHS is 0.56 (0.44): inside this group, the proportion of Specific WUHS is 0.71 (0.50). France and Italy have the lowest proportion of WUHS in the group of the 25 and 50 best performers respectively, with no specific prevalence between Specific and Destination websites.

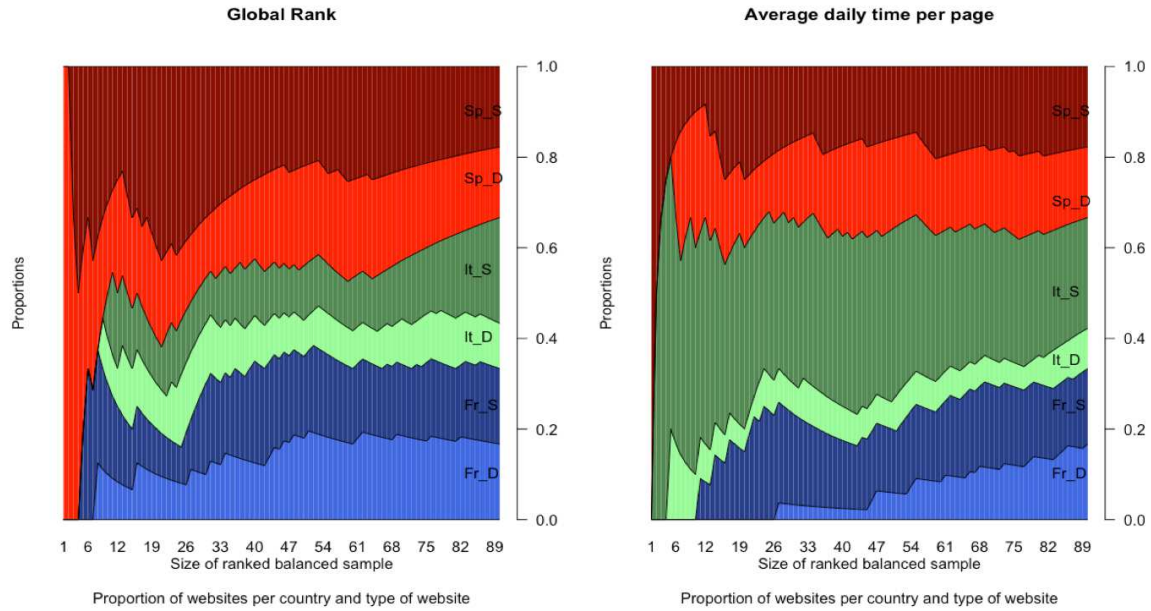

Figure 4: Proportion of websites in the 90 top-ranked websites (Fr_D = "French Destination WUHS", Fr_S = "French Specific WUHS", It_D = "Italian Destination WUHS", It_S = "Italian Specific WUHS", Sp_D = "Spanish Destination WUHS", Sp_S = "Spanish Specific WUHS")

The right panel of Figure 4 show the results about the proportion of WUHS belonging to the balanced ranked sample arising from the performance metric "daily average time per page". The plot shows that Italian WUHS are prevalently those on which the time spent on a page is the highest on average and it confirms that time spent on a page of a Specific WUHS is usually longer than that spent on a Destination one. The differences in performance, also in this case, disappear and change direction as long as the size of the ranked balanced sample increases. In particular, there is evidence that if one focuses on the first 5 (10) top-performers, the proportion of Italian WUHS is 0.80 (0.60): inside this group, the proportion of Specific WUHS is 0.60 (0.50). France is the country with less websites, since it has no WUHS either in the group of the 5 best performers or in that of the 10 best-performers. Likewise, focusing on the first 25 (50) top-performers, the proportion of Italian WUHS is 0.44 (0.44): inside this group, the proportion of Specific WUHS is 0.36 (0.38). France still has the lowest proportion of websites in both groups (25 and 50 best performers). For these groups, the relevant prevalence of Specific WUHS over Destination ones is confirmed.

All these results support H_3, since it can be said that the considerations emerged from the findings obtained when assessing the validity of H_1 and H_2 are still valid if the analysis is restricted to the top performers. The results of these experiments provide evidence about the major importance of Specific WUHS. The focus on global ranks provides evidence that Spanish WUHS are on average the top-ranked ones while Italian WUHS seem to require more time spent by a visitor on a single page.

5 Concluding remarks: Policy and Managerial implications

The paper investigates about the role of managers of cultural and natural sites in designing valuable websites for UNESCO Heritage Sites. Overall, this research contributes to the web-based marketing efficacy of WHS by defining specific attributes that can be used to evaluate websites' performance and to support website designers, thus assisting in the improvement or consolidation of WHS information diffusion and promotion. It is in line with other similar studies that analyse the relative efficiency of tourism operators: see, for example, Gonzalez Rodriguez and Samper (2012). We have analyzed a sample of 142 Specific and Destination Websites related to UNESCO Heritage Sites (WUHS) located in France, Italy and Spain. These countries have been selected based on their geographic location, perceived activeness in WHS promotion, and strong international tourism receipts. An ad-hoc multi source database whose data has been specifically collected to support the research hypotheses is used. Data are analyzed using appropriate multivariate models/techniques in a purely explorative manner. Since related research on a similar topic is very limited, the present research is aimed at filling a gap concerning the management of websites of UNESCO's sites.

The study has been orientated towards understanding if the management of UNESCO heritage sites is able to promote sites efficiently in the World Wide Web (WWW), since limited information is available on the efficacy of promotion strategies as well as on the ability of managers of WHS to reach their markets. Our general conclusion is that

managers could be able to improve the role of websites in promoting a site or a destination based on the findings of the present research. Extending previous literature (Jung and Baker, 1998; Perdue, 2001; Jeong and Choi, 2004) our results document that information content is an important factor affecting the usefulness of WUHS and, consequently, the intent to travel to a destination (Kaplanidou and Vogt, 2006). In view of that, our results lead to the conclusion that managers should design WUHS based on their target markets' needs and the type of information that these markets perceive as useful. Thus, our research method could be considered as an instrument developed to evaluate the quality of WHS websites and to identify the strategic factors leading to the creation of a successful website as well as to identify issues that need to be addressed to strengthen the web-based promotion of the UNESCO's World Heritage Program.

Next, website quality is the users' evaluation of whether websites' features meet users' needs and reflect the overall excellence of the website (Chang and Chen, 2008, p. 821). Our analysis has been focused on information quality (DeLone and McLean, 2003) which is strongly related to website trust (Kim et al., 2011; Filieri, 2015; Wang et al., 2015; Agag and El-Masry, 2017). The importance of website quality is reflected the appreciation of a tourist destination if an appropriate online promotion of the heritage site is carried out once a high-quality website has been designed and implemented. Our results suggest that sites declared heritage of UNESCO not always use website to efficiently promote their heritage, to give general information and tourism information, to engage possible tourists in a virtual experience that can attract a large number of visitors. Thus, promotion and communication should be more efficient and incisive. Visitors should easily find all information, particularly tourism information, when accessing WUHS. They should also be supported online in the organization of their tours. This is not the "standard rule" since efficient promotion and communication is limited to some cases only. Consequently, management of cultural or environmental sites is required to report more adequate information on WUHS and to choose proper communication media. This is a fundamental activity for the creation of a successful website which is able to attract and engage online visitors and to transform them in real tourists. In a nutshell, managerial efforts should be more orientated towards creating an "adequate" WUHS intended as a virtual place where tourists can find all the relevant information.

As for the specific results of our analyses, our primary concern was to understand if relevant differences exist between Specific WUHS and Destination WUHS located in the three observed countries with respect to the amount of information reported in WUHS and/or in their performance metrics (first research hypothesis). Empirical evidence shows that in all countries, particularly in Spain, Destination WUHS are ranked better than Specific ones: Spanish WUHS are those created less recently but, at the same time, ranked better on average, whereas Italy is late in reporting information for tourists and consequently ranked worse on average. As for the amount of reported information, French WUHS are the most completed ones while Italian WUHS lack of some primary information.

Secondarily, to assess if a properly organized WUHS contributes relevantly to improve tourists' perception of the site and stimulates their willingness to be subjected to an emotional experience we have analyzed the causal relationships between performance

metrics of WUHS, or time spent by users when visiting WUHS pages, and variables measuring their specific information content, based on the assumption that the links between a site's attributes and the tourists are essential to understand tourists' motivations to visit heritage places (Poria et al., 2004). We have considered this issue by investigating about the factors causing a WUHS to be more popular (second research hypothesis). Results provide evidence about a superior rank of a restricted group of Spanish WUHS with less than 4 pages visited per day, whose amount of touristic and contact-and-support information positively influences the website reputation. These WUHS have not been created recently, thus it seems that an initial trial period is normal for a WUHS to become effective. Furthermore, it emerges that Specific WUHS are those where a visitor uses to spend more time on average, mainly because of a large amount of external information and the presence of a limited number of brands in the homepage. The effectiveness of reported information in WUHS is also confirmed by the reduction of the average time spent in visiting a page in the case WUHS contains more touristic and external information. In such a case, a positive effect of touristic information is extended to the ranking of the WUHS as well.

Next, we have conjectured that all the results summarized above could be biased since the relationship between websites' rankings and the geographical localization of the heritage sites is not symmetrical. In other words, it is not straightforward to assume that the group of the first N top-performers WUHS is composed of the same proportion of French, Italian and Spanish WUHS or, equivalently, of the same proportion of Specific and Destination WUHS (third research hypothesis). Assessing this hypothesis is equivalent to verify the validity of the results obtained for the first two research hypotheses in the case the analysis is restricted to the top performers WUHS. Results of experiments made on balanced rank samples confirm the major importance of Specific WUHS, as well as that Spanish WUHS are on average the top-ranked ones while the Italian ones are those with the highest time spent by a visitor on a single page.

In our opinion, our empirical results are useful for those who are at different levels involved in the development of a tourism destination and need to understand something more about the structure of a WUHS, as well as about its content. The main finding is a clear requirement for the managers of UNESCO sites, who are asked to decide about both the role a WUHS should have and the kind of communication it wants to create. The elevate number of Specific WUHS confirms that the heritage sites use the WWW to promote and to communicate their resources. However, we document that Specific WUHS are less able then Destination ones to attract and to engage online visitors. For this reason, Specific WUHS have to improve their online communication and to include all elements that can favor online success. Particularly, they should include touristic information and the elements that facilitate the contact with the heritage site. The major importance of these two elements supports the idea that online visitors mainly want to find information useful to a plane trip to the destination and/or to visit the heritage site. The two elements are equally relevant in determining how heritage sites can become a way to attract visitors on the destination.

Moreover, the online success of WUHS is certainly linked with the time that online visitors spend in visiting the website. The ability to immediately raise the interest of

online visitors in this way obtaining online success should be the aim of the WUHS design. As evidenced by the results of the analysis, to increase the time spent during a WUHS visit it is important to include the brand of UNESCO and the links with other local institutions. The first element evidences the importance to use a reference that can state and confirm the specificity and importance of the heritage site and it can identify a specific destination. The second element evidences how the creation of real and virtual networks is a support in the effort to attract visitors and to improve the touristic flows.

To sum up, we can argue that the extreme heterogeneity of WUHS information content lead us to the conclusion that "diversity is the norm". We highlight a clear warning for policy makers and tourism managers as regards the effectiveness of WUHS and, at the same time, we require that website designers make some efforts toward defining an efficient architecture for WUHS. At the same time, we are aware that it would be interesting to replicate our approach in other countries whose size, tourism development, and density of WHSs is similar to the observed countries, with the results having direct managerial and policy implications for those sites and destinations. This is our agenda for further research into this topic.

Acknowledgements

The research is supported by Regione Autonoma della Sardegna (Programmazione Unitaria 2007/2013- P.O. FESR 2007/2013, Interventi a sostegno della competitivitá e dell'innovazione 2016-2018 – Support to innovation and competitiveness 2016-2018). Authors wish to thank anonymous reviewers for their helpful comments which allowed to improve the overall quality of the paper.

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