

Virtual Accessibility in European Cultural Heritage: Analysis of the Major Tourist Destinations Websites

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Abstract: In this article, it is evaluated the problem of accessibility to digital information on several websites, and its importance to the promotion of cultural heritage on European countries. The main objective is to understand how institutional web content related to European Cultural Heritage meets the accessibility requirements of the World Consortium Web Content Accessibility Guidelines WCAG 2.0. Through the analysis of fourteen European institutional cultural heritage websites, it was possible to identify strengths, weakness and improvements of each one, from the perspective of any user and those who have, permanently or temporary, limitations. The final analysis revealed several weaknesses that affect the interest and motivations of tourists and other users regarding the diversified cultural heritage and cultural heritage products. Several governmental institutions need a greater effort to make universal accessibility a reality. Failing to comply with the basic principles of universal accessibility will negatively affect the sustainability of cultural goods.

Keywords: Digital accessibility, accessible tourism, innovation, institutional websites, cultural heritage, cultural tourism

1. Introduction

Globalization has affected both the tourism industry and the cultural heritage of several countries. The Internet has reshaped the way information on Tourism and Cultural Tourism is made available.

The transferability, in the context of the Internet, refers to the provision of information to all users, regardless their limitations, technology or platform used. It is about allowing access, in general, to all users, in order to apprehend, understand, navigate and interact with the Web, regardless of its particularities (visual, auditory, physical, speech, cognitive, neurological, among other needs).

In this article we discuss, therefore, the problem of accessibility to digital information on various websites, and its importance in the promotion of culture and cultural heritage in several European countries.

Thus, the main objective is to understand how institutional web content, related to culture and, in particular, to European Cultural Heritage, comply with the accessibility requirements set out in the Accessibility Guidelines for Web Content Accessibility Guidelines 2.0 of the World Wide Web Consortium (W3C), referred in Directive (EU) 2016/2102 of the European Parliament and European Standard EN 17161:2019.

Methodologically, it was realized a critical review of the existing literature and its contextualization, regarding the themes referred. Subsequently, through a sampling, it was selected among the European panorama of cultural heritage sites, the 14 countries that the World Bank considers most representative given the highest number of tourist arrivals.

To verify the degree of compliance with the recommendations of WCAG 2.0, whose Portuguese version was developed by the ACCESS Unit of the Foundation for Science and Technology, we used the Automatic Validator AccessMonitor Plus for version 2.0 since the latest version does not exist in Portugal.

The computer analysis of the results of the websites allowed the acquisition of quantifiable data, which could enhance the qualitative analysis of the strengths and weaknesses and the needs for improvement that the sites analysed need, from the perspective of any user, but also those that present, permanently or temporarily, limitations.

The final analysis revealed several weaknesses that affect the interest and motivations of tourists and other users, given the varied offers of the cultural heritage product.

2. Methodology

The methodology followed in this research was based on the critical review of the existing literature, its contextualization and the analysis of the selected websites related to the European panorama of the cultural heritage sites of 14 destinations, selected through the analysis of international arrivals in 2017 (World Bank, 2017).

Afterward, guidelines were elaborated to observe the compliance with online accessibility requirements, having as evaluation items the international accessibility guidelines. Then, the quality of the information disclosed on the respective websites was analysed, considering virtual accessibility.

The sample studied, as mentioned above, was about 14 websites, either from outgoing markets of extreme importance for the Portuguese national tourism, reflected in the 2027 Strategy, which are listed: Spain, Germany, united kingdom, France, The Netherlands and Ireland (strategic markets), Italy, Austria, Poland (growth markets); or other European reference markets such as Greece, Croatia, Portugal, Denmark and the Czech Republic (Turismo de Portugal, 2017).

After the collection of URLs, a quantitative and qualitative analysis of the data obtained in the mentioned countries was performed. To verify the degree of compliance with the recommendations of WCAG 2.0, whose Portuguese version was published in 2014 and developed by the ACCESS Unit of the Foundation for Science and Technology, it was used the Automatic Validator AccessMonitor Plus, version 2.0.

The elements chosen for qualitative analysis were the existence of the accessibility symbol, available languages, existence of research functionality and references to accessibility and/or issues related to accessible tourism.

The elements chosen for quantitative analysis were image captions, multimedia use, forms, menus, headers and indication of the main language, links, menus and texts of the links, links outlined blocks of information, compliance with W3C guidelines and elements and attributes of metadata presentation.

In this study, AccessMonitor Plus was used likely in other research work that we have in preparation or already published (Silva and Borges 2020; Borges et al., 2019; Pinto et al., 2019) also used the version available in our country. These studies will enable, soon, a comparative analysis between the various websites under study or already studied.

3. Literature Review

The concept of cultural heritage has evolved over time, and its definition is very subjective, as well as the definition of culture, in which it is inserted. However, usually everyone agrees that cultural heritage and culture should be protected and preserved as a legacy of the past for future generations. The Declaration of Mexico on Cultural Policies of UNESCO (1982) considers that the cultural heritage of a people includes the works of its artists, architects, musicians, writers and scientists and also of anonymous artists, as expressions of the spirituality of the people. It includes tangible and intangible works such as languages, rites and beliefs, historical places and monuments, literature, works of art, archives, and libraries. The analysis of the websites referred in the methodology, allows to consider that the definition above is broad enough to cover the diversity of topics.

Cultural, tangible and intangible heritage increasingly has a direct relationship with tourism. This relationship can and should be strengthened to articulate new alternatives for tourism development, through the management of cultural heritage that enables its transformation into tourist resources.

For Timothy and Boyd (2003), cultural and heritage tourism overlap and are interchangeable. Heritage tourism definitions include elements of the human past as a resource, and all of them refer to a variety of reasons why tourists travel: learning something new, spending time with friends or family, satisfying a curiosity, or simply spending free time (Timothy, 2011). In this sense, there are several studies that show that the knowledge of the culture of other places is one of the main motivations that drive tourists (Pereira and Gosling, 2017).

The development of tourism around cultural heritage is very important, since it enables the necessary sustainability to communities and an improvement of the image through various factors such as rehabilitation and conservation of heritage. Economic growth is also focused on the marketing of local goods; in the increase

of tourist equipment, many of them through the rehabilitation and adaptation of the local architectural heritage, with the consequent social benefit of communities and their living conditions (Tuan and Navrud, 2008; Cano, Garzón and Sánchez-Soto, 2013). This type of tourism can also contribute to the reduction of seasonality and encourage openness to new markets.

Each community has something unique to offer, which can help to generate considerable tourist flows, and making the collective memory endure. Thus, community involvement and participation are essential. It should be the pillar in the process of tourism development and heritage management (Choi and Sirakaya, 2005).

In fact, management, integration, and cooperation are increasingly required in an added-value network, which is mainly geared towards consumer satisfaction. A tourist destination, despite the different concepts, can be understood as "both a system of attractions and the geographic area that encompasses them, identified on the basis of the range of needs of intermediate or final clients" (Sainaghi, 2006:1054). It includes a mix of products and services available in a locality with the ability to attract visitors, offering them an integrated experience (Buhalis, 2000; Murphy et al, 2000).

The satisfaction of needs of each tourist by the destination leads to greater or lesser attractiveness (Vengesai, 2003). So, the major value of destination attractiveness is the pulling effect attractiveness has on tourist (Kim and Lee, 2002).

Promotion of tourist destinations has evolved over time towards a more digital aspect, to adapt to the needs of the market. Distances have been shortened using digital platforms, such as websites, which become the "face" of the online tourist destination. They must have the tourist offer of the destination updated and presented clearly, so that it is easily perceived by the tourist and corresponds to their needs. For this it is crucial to understand how users will access the website and what they want when they access the website (Ryan, 2014).

Potential tourists are often inspired by the information available on the destination's institutional website, which influences their decision-making and consequent purchase. For this to happen, the information provided, the ease of access to it and the confidence associated with the preparation of the trip with all the appropriate accessibility requirements, must be easily accessible, applying the principles of universal design, facilitating the final choice of the tourist destination.

4. Virtual Accessibility as an innovation factor

The scarcity of information on accessible tourism is still a common problem for most countries. Even when it is available it is very fragmented and focuses on aspects, essentially, motor skills. Thus, the disabled tourist will base their decisions on the information they find online, without having the perception whether this accessibility is provided to be able to complete their planning and decision-making process (Michopoulou and Buhalis, 2013).

In the field of virtual accessibility, the progressive need to develop and access reliable information online has stimulated the creation of guarantees to content access. In this context, the World Wide Web Consortium (W3C) - an international community in which members work together to define the standardization of web technologies, with the mission of developing high-quality protocols and guidelines that ensure the continuous development of accessibility and the exploitation of its full potential (WC3, 2020), being one of the most important sets of guidelines to be applied to computer-carrier interaction with disabilities - lists several components to be articulated in the interaction and development of a webpage to be accessible and provides the basis for understanding the different accessibility standards developed by the W3C Web Accessibility Initiative (WAI).

In 1999, Portugal was the first Member State to adhere to the accessibility guidelines of the World Wide Web Consortium (W3C), and the first initiative for the inclusion of accessibility occurred with the promulgation of Decree-Law No. 123/97 of May 22. In 2012, through Resolution of the Council of Ministers No. 91/2012 of November 8, the Portuguese Public Administration would have to adopt WCAG (Web Content Accessibility Guidelines) 2.0 Standards of WC3 through the publication of the National Digital Interoperability Regulation (RNDI).

With the introduction of the recent Decree-Law No. 83/2018 of 19 October, all websites are required to comply with certain rules and implement them by September 2019.

The Accessmonitor software was developed by Portuguese government, being this an automatic validator that verifies the application of accessibility guidelines in the HTML content of a website. AccessMonitor uses as a reference the WCAG 2.0 version of the World Wide Web Consortium (W3C). According to the Accessibility Guidelines for Web Content 2.0 (W3C, 2020), it is considered necessary to a website be considered accessible, that alternatives in text to any non-textual content are provided. Thus, it allows the adaptation to the needs of each user, such as the printing in enlarged characters, braille, the braille possibility of reading aloud (available as a functionality), symbols and simple language. All content must be adaptable, perceptible, and accessible via the keyboard. Special care should be taken to ensure that users have sufficient time to use the content in a readable and understandable manner. It is also important that there is the option of help, available during navigation, and multimedia elements must provide content and texts properly identified, with subtitles or audio description.

AccessMonitor Plus displays the results (of a page or a sample of pages) on a scale of 1.0 to 10.0, thus synthesizing only in a value the degree of satisfaction of the automatic tests performed by the validator. The three types of results are stratified by three priority levels ('A', 'AA' and 'AAA').

The programme provides a qualitative report for each page analysed. In turn, this is divided into two parts: in the first, in two sections, it has a brief description of the sample and a detailed presentation of the results; in the second part, the results are also divided into two parts, and the summary and exhaustive detail of the tests performed are presented (Silva and Borges, 2020).

5. European Cultural Heritage: accessibility of the institutional websites of tourist destinations

The sample reflects the European overview of websites related to the protection of cultural heritage and culture of the fourteen countries with the highest number of arrivals, according to existing data for 2017, including also the ten most visited European countries in the world (France, Spain, Italy, United Kingdom, Turkey, Germany, Austria, Russia, Portugal, Poland). AccessMonitorPlus was used to analyse institutional European cultural heritage websites from Portugal, France, Spain, Italy, United Kingdom, Germany, Austria, Greece, Poland, Netherlands, Croatia, Denmark, Ireland and the Czech Republic.

Tests were performed on the main pages of each website. Since the first webpage is the first user interface, it was considered that these would already be a valid indicator of the concern of the entities regarding info accessibility.

All test results were compiled between January 10 and 13, 2020. This data is important as websites are constantly updated, so the validity of the analysis is relatively short.

The compliance of the analysed websites with the various levels is very varied (Table 1), although none of them reaches the desired value of 10 and very few are closed to that. It was also inferred that the result, in some cases, varies according to the language in which the site is consulted.

Table 1: Characterization of some elements of the analysed websites. Elaborated by authors.

| WEBSITES HOME PAGE | ACCESSMONITOR PLUS INDEX | DISPLAY OF ACCESSIBILITY SYMBOL | LANGUAGES AVAILABLE | SEARCH FUNCTIONALITY | REFERENCE ACCESSIBILITY | REFERENCE TO HERITAGE AND /OR ACCESSIBLE CULTURE |
|--|-----------------------------|------------------------------------|---------------------|----------------------|-------------------------|--|
| France - Ministère de la Culture - https://www.culture.gouv.fr/ | 6.3 | No | 5 | Yes | Yes | Yes |
| Spain - Ministerio de Cultura y Deporte https://www.culturaydeporte.gob.es/cultura/patrimonio/portada | 7.5 | No | 5 | Yes | Yes | Yes |
| Italy - Ministero dei beni e delle attività culturali e del turismo https://www.beniculturali.it/mibac/export/MiBAC/index.html | 6.5 | No | 0 | No | Yes | No |
| United Kingdom - Department for Digital, Culture, Media & Sport https://www.gov.uk/government/organisations/department-for-digital-culturemedia-sport | 9.9 | No | 0 | Yes | Yes | No |
| Alemanha - Germany Culture https://www.deutschland.de/en/topic/culture | 7.9 | No | 9 | Yes | No | No |
| Austria - Culture in Austria https://www.austria.info/uk/things-to-do/cities-and-culture | 5.3 | No | 19 | Yes | No | No |
| Greece - Ministry of Culture and Sports https://www.culture.gr/en/SitePages/default.aspx | 5.6 | No | 1 | Yes | No | No |
| Poland - Polish culture - https://culture.pl/en | 5.8 | No | 2 | Yes | No | No |
| Netherlands - Dutchculture - https://dutchculture.nl/en | 6.2 | No | 1 | Yes | No | No |
| Croatia - Ministarstvo kulture Republike Hrvatske - https://www.min-kulture.hr/default.aspx | 3.6 | No | 1 | Yes | No | No |
| Portugal - DGPC Directorate General of Cultural Heritage http://www.patrimoniocultural.gov.pt/pt/ | 6.9 | Yes | 1 | Yes | Yes | No |
| Denmark - https://denmark.dk/people-and-culture | 8.8 | No | 1 | Yes | No | No |
| Ireland - https://www.cultureireland.ie/ | 6.9 | No | 1 | Yes | No | No |
| Czech Republic - https://www.mzv.cz/en/Culture | 4.2 | No | 1 | Yes | No | No |

5.1 Qualitative analysis in the user's perspective

The results show that these countries are not, in fact, prepared to comply with the guidelines of the new European legislation, respectively to the new guidelines made public on 21 March 2019 and set out, as we mentioned, in the European Accessibility Law and the Design for All Standard.

Since our main objective is to perform qualitative analysis from the user/consumer perspective, and that to present a study involving the 61 success criteria of WCAG 2.0 is a very difficult task to achieve, it were analysed only those that we consider most important from the perspective of the accessible cultural tourism user, and, of course, that fit the principles of universal accessibility.

The elements chosen for the qualitative analysis were: display of the accessibility symbol, languages made available, the existence of research functionality and the reference to accessibility or accessible culture thematic (Table 1). In the table we count the languages in which the site can be consulted, except the native one.

The analysis presented starts with the websites that have a better behaviour compared to the selected criteria and with higher indexes in the results of the AccessMonitor Plus study.

The UK website of the Department for Digital, Culture, Media & Sport almost achieves full compliance (9.9). In addition to the UK website, the best-rated websites in terms of accessibility are those of Denmark (8.8), Germany (7.6) and Spain (7.5).

The English website presents services and information available to people with disabilities on the main page. However, and as they assume, they only have some pages available in other languages (which we did not find), and they do not meet some of the requirements (although they say they will do so). Thus, the accessibility of the website is not, in our view, as clear as the score obtained. Being a department with too many skills, distributed by various ministries, does not facilitate the website use, thus, it is not intuitive and not easy to access information. It provides diverse cultural or heritage information, and very little about accessible places or experiences. Although the site has the maximum quotation, it is not frankly enlightening in relation to the themes of this study.

The Danish website called *People and Culture* provides easier access, and various information about the culture, history and heritage of this country is available in a very direct and accessible way. However, it does not refer to the accessibility of the site or makes mention of heritage and/or accessible tourism.

The German culture website is divided into several sections and depends on the Ministry of External Relations. It gives in some texts the accessibility and importance of accessibility in culture, but it has no specific elements on these themes. It features an interactive map with the various German monuments where some information is available.

The Spanish institutional website is divided between culture and sport. In the area of culture, it has tabs related to fourteen major themes. In terms of accessibility it has a large section related to accessible and inclusive Museums, but the site does not allow automatic reading of the text. Like French, among others, it states that it meets the minimum requirements of the World Wide Web (W3C, 2020).

The website of the French Ministry of Culture has a great diversity of information about the various areas of culture. These reflect a very broad perspective of what a country's culture really is. It offers the signature of newsletters with a wide variety of topics to choose from, with 19 tabs relating to the various "delegations" of the Culture Ministry, in a policy of decentralization and proximity, and also for two cultural affairs missions, respectively, from New Caledonia and French Polynesia. In terms of accessibility, it allows, through the Read Speaker system and the automatic reading of the text, colouring of words and phrases as they are being read, as well as increasing the size of letters, among several other features, but only in the French language. As a great innovation to highlight, is the possibility of downloading to mp4 files the reading of texts. However, there are no specific pages for cultural accessibility.

The Ministry of Education, Culture and Science of the Netherlands provides a very diverse site, but difficult to consult on the topics under analysis, and does not give importance to the factors of accessibility of both culture and the website.

Regarding the website of the Ministry of Goods and Cultural Activity and Tourism of Italy, besides having links to many other institutions, especially those related to museums and restaurants the search for the various cultural goods is not intuitive and quick to consult. The fact that it does not have the possibility of searching, nor the availability of the website in any other language, results in a weak accessibility of this site.

The Portuguese website, of the Directorate General for Cultural Heritage (DGPC), shows, like that of Ireland, a value of 6.9 in the W3C Accessibility Practices Report (WCAG 2.0). It informs that the DGPC, as part of its social responsibility policy, does not guarantee that this site is 100% accessible, but confirms an effort to increase its accessibility in accordance with Council of Ministers Resolution 97/99 on accessibility of public administration websites by citizens with special needs.

From the user's perspective, it is a website that provides various information on the various types of Portuguese heritage and cultural activities, especially museums. It offers the georeferencing of the heritage, its classification and its description, as well as links to departments, regional divisions, palaces, monuments that are attached to it, distributed throughout the country, among many other information relatively easy to access. Some of it is not publicly accessible, like the Archaeologist's Portal. As a differentiating element, it also refers to the project "Portugal: Art and Heritage", a partnership of Google Arts & Culture with the Ministry of Culture Portuguese, through the DGPC, which allows anyone interested, anywhere in the world, the possibility of enriching their knowledge about the collections of museums and national monuments of Portugal.

Ireland's main objective is to promote Irish arts around the world. In a first approach it does not give us a quick information on the subjects under study, being a simple site. Although it does not mention accessibility conditions, it allows the increase of the font size. It is only available in English and depends on the Irish government.

The official Austrian website provides a wide range of easy-to-access information about the cities and heritage of this country. Concerns about accessibility and cultural and accessible tourism are not present, but there is a great focus on the appeal to tourists from various countries as proven by the 19 languages, besides Austrian, in which the site is made available.

The Polish website is divided into six sections, and from the perspective of the user, it is easy to access information about Polish heritage and culture, giving great emphasis to gastronomy. It is the only website that allows to adapt the brightness to make it easier to see people with sight problems.

The Greek website depends on the Ministry of Culture and Sports, with various information on heritage and culture. Being also relatively easy to access, it stands out, by originality, a dynamic frieze, at the bottom of the page, which allows access to the various links on various topics related to Greek culture and sport.

The website of the Croatian Ministry of Culture only presents information in English, in addition to the native language. However, most pages are not translated. It has relatively few sections related to cultural diversity, only three, and essentially informing contacts. We cannot understand any concern about accessibility or where information about the various cultural components of the country is located. The same is true of the website of the Ministry of Culture of the Czech Republic, in which some pages were not possible to open.

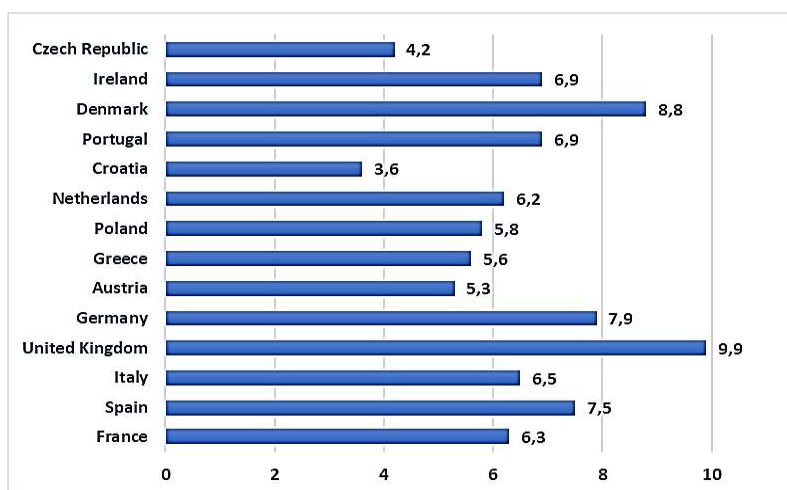
Analysing the generality of the data obtained, we can mention that only Portugal uses the symbol of accessible website even though many other countries, as can be seen in Table 1, refer to the accessibility of their websites. In contrast, all websites, except the Italian, offer the search feature, very useful for any user.

The languages available, being also an indicator of accessibility, fluctuate in number, from only the native to 19, as in the case of the Austrian website. It is a highlight that few countries offer several languages, most of which only offer English in addition to native. The Italian website is only displayed in that language.

5.2 Quantitative Analysis

The elements chosen for quantitative analysis were, as we mentioned, the captions of the images, the use of multimedia, forms, menus, headers and the indication of the main language, links, menus and text of the links, links to the outline of blocks of information, compliance with the W3C guidelines and, finally, the elements and attributes of presentation of the metadata.

The quantitative analysis of the results allowed us to reach some conclusions in terms of accessibility (Graphic 1). The results confirm a very poor accessibility for anyone other than a computer technician, regarding the websites of the countries studied.



Graphic 1: AccessMonitor Plus indexes for the websites analysed. Elaborated by authors.

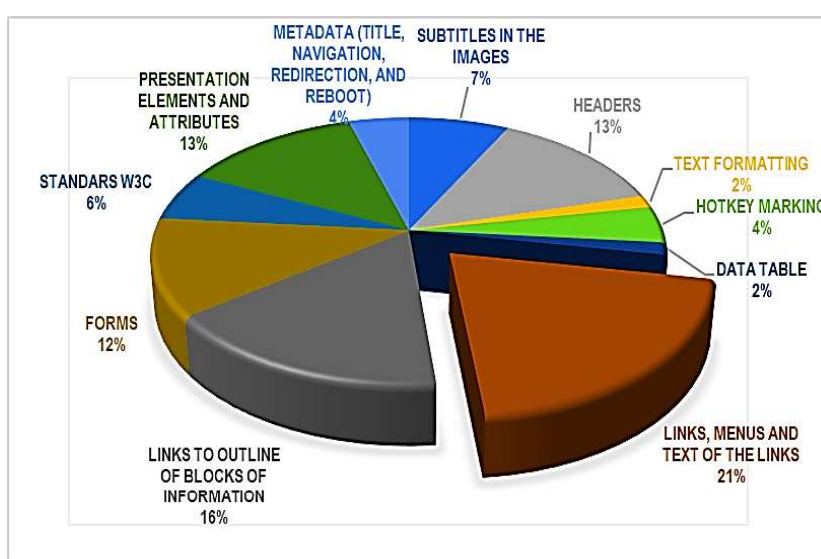
This situation is worst to the extent that the target audience of the study is composed by common users, with or without special needs, potential tourists. In the most websites analysed, users will have difficulty to find, and later, to capture the information they need. These difficulties are substantially increased when accessibility problems are physical. What can happen is that the potential tourist with interest, although superficial, in the cultural heritage and culture of the various countries under analysis, are discouraged, going to look for another type of tourist attraction or, even, seeking help in the various agents in the area of tourism who, of course, will offer other offers, thus guiding their choice.

Our research has revealed positive, but also, negative data. From the positive perspective, it is possible to mention the absence of errors in the presentation of the main language, as well as in the contrast of information and in the presentation of multimedia data, that is, the spots as well as the images, the tourist destinations and their potential. It is also worth mentioning the small percentage of errors, respectively of 2%, with regard to the formatting of the text of the various websites, as well as in the data tables, and 4% in the marking of hotkeys, as well as in the metadata (title, navigation, redirection and reboot) (table 2).

Table 2: Detailed results of the A-level tests performed and that presented non-conformities. Elaborated by authors

| WEBSITES - HOME PAGE | IMAGE CAPTIONS | MULTIMEDIA | HEADERS | TEXT FORMATTING | INFORMATION CONTRAST | MARKING HOTKEYS | DATA TABLE | LINKS, MENUS AND TEXT OF LINKS | LINKS TO OUTLINE BLOCKS OF INFORMATION | FORMS | STANDARS W3C | PRESENTATION ELEMENTS AND ATTRIBUTES | METADATA (TITLE, NAVIGATION, REDIRECTION, AND RESTART) | LANGUAGE HOME | LEVEL TO ERROR TOTALS | INDICE ACCESSMONITOR PLUS |
|----------------------|----------------|------------|---------|-----------------|----------------------|-----------------|------------|--------------------------------|--|-------|--------------|--------------------------------------|--|---------------|-----------------------|---------------------------|
| France | 1 | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | - | - | 6 | 6.3 |
| Spain | - | - | 1 | - | - | - | - | 1 | 1 | - | - | - | - | - | 3 | 7.5 |
| Italy | - | - | - | - | - | - | - | 2 | 1 | - | - | 2 | - | - | 5 | 6.5 |
| United Kingdom | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | 9.9 |
| Germany | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | - | 2 | 7.9 |
| Austria | - | - | - | - | - | 1 | - | 1 | 1 | 3 | - | 2 | - | - | 8 | 5.3 |
| Greece | 1 | - | 1 | - | - | 1 | - | 1 | 1 | 1 | 1 | 1 | - | - | 8 | 5.6 |
| Poland | 1 | - | 1 | - | - | - | - | 1 | 1 | - | - | - | - | - | 4 | 5.8 |
| Netherlands | 1 | - | 1 | - | - | - | - | 1 | - | 1 | - | - | - | - | 4 | 6.2 |
| Croatia | 1 | - | 1 | 1 | - | 1 | 1 | 3 | 3 | 1 | 2 | 1 | 2 | - | 17 | 3.6 |
| Portugal | - | - | 1 | - | - | - | - | 1 | - | - | - | - | - | - | 2 | 6.9 |
| Denmark | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | 1 | 8.9 |
| Ireland | - | - | 1 | - | - | - | - | 1 | 1 | - | 1 | - | - | - | 4 | 6.9 |
| Czech Republic | - | - | 1 | - | - | - | - | 1 | 1 | - | - | 1 | 1 | - | 5 | 4.2 |
| TOTAL 1 FVFI ERRORS | 5 | 0 | 9 | 1 | 0 | 3 | 1 | 14 | 11 | 8 | 4 | 9 | 3 | 0 | ---- | ---- |
| % LEVEL ERRORS | 7% | 0 | 13% | 2% | 0 | 4% | 2% | 21% | 16% | 12% | 6% | 13% | 4% | 0 | ---- | ---- |

Contrary to what we have observed in other studies (Silva and Borges 2020; Pinto et al, 2019a; Borges et al 2019b) in the W3C standards criteria, the percentage of errors is not very significant, with a value of 6% of the sample, which may explain that the compliance index achieved by most of the websites analysed are around the high average and average values, with only substantially low values in the ACCESSMONITOR PLUS index in countries such as Croatia (3.6) or Czech Republic (4.2).



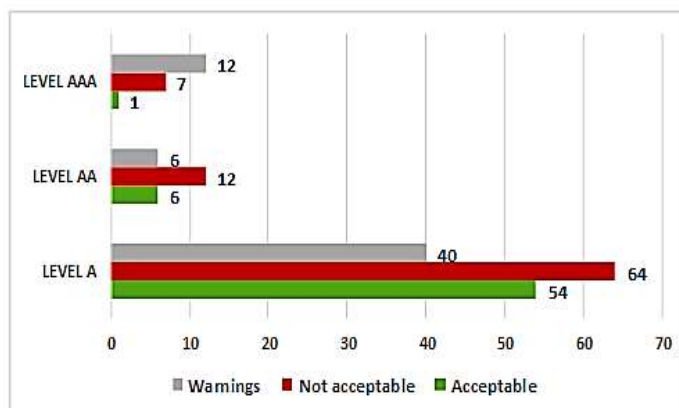
Graphic 2: Percentage by type of A-level errors displayed on the analysed websites. Elaborated by authors

It was also possible to observe that 7% of the websites have errors in the subtitling of the images making it difficult to understand them. In addition to these errors there are still some inaccuracies reported in the

warnings. As a rule, all images should have a caption (when you pass the image with cursor or your hand touch screens), which does not happen on several of the websites under analysis.

Several websites also present errors in the forms (12%), that is, there is no information that contextualizes the subjects and explains what should be completed. This creates another obstacle, especially for people using supporting technologies, as they cannot access the explanation of what they should fill in.

As we can see in Graphic 2, the marking of headers presents errors in 13% of the websites, very high and unusual value, significantly increasing the difficulty in searching for the subjects and their subsequent reading, since in a large patch of text the attention is not maintained. With equal value of errors, we have the elements and attributes of presentation of the contents, reinforcing what was mentioned before.



Graphic 3: Results of the "A", "AA" and "AAA" level tests found. Elaborated by authors

The largest amount of concentration of errors, in the order of 16%, is related to links to the outline of blocks of information, either by repeating many times what has already been said, or because they are so extensive that users do not read them, losing their informative function. These errors are further compounded by prefiguring the highest values of the sample's A-level errors, with a magnitude of 21%, in the links, menus, and text of the links. Regarding the errors in relation to the tests of level "A", "AA" and "AAA", the next figure (Graphic 3) presents the total of acceptable errors, not acceptable and warning per level. Table 3 presents the total of errors in each level according to the sample use for this study. From this quantitative analysis of errors by level, it is possible to conclude the existence of relatively high values and, as such, reveals the problems that the vast majority of websites present, in terms of compliance with what is intended to be an accessible website for all.

Table 3: Results of the "A", "AA" and "AAA" level tests found. Elaborated by authors

| COUNTRY | LEVEL A | | | | LEVEL AA | | | | LEVEL AAA | | | |
|----------------|------------|----------------|----------|-------|------------|----------------|----------|-------|------------|----------------|----------|-------|
| | Acceptable | Not acceptable | Warnings | TOTAL | Acceptable | Not acceptable | Warnings | TOTAL | Acceptable | Not acceptable | Warnings | TOTAL |
| France | 4 | 6 | 4 | 14 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 |
| Spain | 6 | 3 | 2 | 11 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| Italy | 4 | 5 | 4 | 13 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 1 |
| United Kingdom | 6 | 0 | 4 | 10 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| Germany | 6 | 2 | 3 | 11 | 1 | 0 | 1 | 2 | 0 | 1 | 1 | 2 |
| Austria | 3 | 8 | 4 | 15 | 1 | 2 | 1 | 4 | 0 | 1 | 1 | 2 |
| Greece | 3 | 8 | 3 | 14 | 1 | 2 | 1 | 4 | 1 | 2 | 1 | 4 |
| Poland | 2 | 4 | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| Netherlands | 3 | 4 | 4 | 11 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| Croatia | 4 | 12 | 1 | 17 | 1 | 2 | 2 | 5 | 0 | 0 | 0 | 0 |
| Portugal | 5 | 2 | 5 | 12 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 2 |
| Denmark | 3 | 1 | 4 | 8 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| Ireland | 4 | 4 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Czech Republic | 1 | 5 | 0 | 6 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| TOTALS | 54 | 64 | 40 | 158 | 6 | 12 | 6 | 24 | 1 | 7 | 12 | 20 |

6. Discussion

Regarding qualitative analysis, our research has shown that, with the exception of websites related to the culture and cultural heritage of France and Ireland, none of the other websites allow us to change the size of the letters, and only that of Poland allows the brightness to be adapted. The existence of these requirements is essential to enhance virtual accessibility, so it can be concluded that there is no clear concern about these issues. The best-achieved website, although not the one with the best score, is French, according to the various elements made available through the Read Speaker system and already mentioned.

According to the quantitative analysis, the average compliance with accessibility requirements is 6.52, on a scale of 1.0 to 10, not enough to pass the level A of accessibility of the websites, remaining, in a general analysis, at very low levels. We found that none of the websites under study is considered fully accessible, i.e. internationally, only the United Kingdom website meets almost all requirements, so there are no accessible websites.

It should also be noted that the effective and efficient development of a website necessarily involves knowledge of different areas, including techniques, but also accessibility experts. It would therefore be suitable for multidisciplinary teams to work together to prevent failures that should no longer exist. Thus, the existence of some of the errors pointed out would be minor. Although the errors found are not serious from a functional point of view, they are crucial for users with some disability or low technological knowledge.

The development of a website involves, in addition to technical aspects, valuing the knowledge of visitors as potential consumers, regardless of their technical or personal profile. There is still an evolution that needs to be made by most of the European countries examined.

7. Conclusion

The purpose of the guidelines underpinning this research is to help organisations to develop a consistent approach by defining requirements that enable them to develop and provide products, goods or services that can be accessed, understood and used by all, including people with disabilities. As each user has their profile of needs, characteristics, or capabilities, it is very important to take these factors into account when planning products or services of any typology.

Although there is an effort from the various institutions, there is still a long way to go. Applied studies such as this one, which produce an analysis of the existing in relation to the introduction of elements of technological information innovation and accessible and inclusive information, remain scarce, but are very important.

First of all, these studies warn the lack of compliance with European legislation and guidelines, as well as the problems of the lack of physical, communicational and informative accessibility, relating to Accessible and Cultural Tourism and its various valences which do not yet deserve the attention of operators and institutions. In this way, this study pretends to alert organizations to develop a consistent approach by defining requirements that allow them to develop and provide products, goods or services that can be accessed, understood and used by all, including people with disabilities. A strategy for communication and promotion of culture and cultural heritage of a tourist destination should be developed to capture the market for accessible and cultural tourism, using websites that provide technology adapted to all types of users.

It can therefore be concluded that the results obtained in this research are not satisfactory, revealing the non-compliance with the European guidelines to which the institutional websites analysed are obliged, as it was already referred. This finding is worrying because the sample analysed corresponds to the main means of dissemination and tourist information regarding the culture and cultural heritage of several European reference countries, which are crucial for world tourism.

Also worrying is the fact that, as a rule, the institutions responsible for the culture and cultural heritage of the several European countries do not show a real concern for the various targets with or without any kind of disability. They do not enhance their websites, which are the showcase of the various countries, in different themes, but also in their culture. The several national institutions need to make an increased effort to ensure that universal accessibility is a reality, both in terms of the enjoyment of the cultural heritage they manage and

in terms of the virtual accessibility of their websites. If they do not comply with the basic principles of universal accessibility, these institutions will adversely affect the sustainability of cultural goods.

An accessible Internet, answering to the requirements of universal accessibility, allows all people, with or without special needs, to participate more actively in society (Silva and Borges, 2020).

The niche market for accessible tourism, and accessible cultural tourism, still does not deserve attention from the official institutions. Those institutions must strive for the construction of an accessible Internet that meets universal accessibility requirements and allows all people with or without special needs to participate more actively in society and in the knowledge of European cultural heritage.

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