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Web Accessibility Implementation in Spanish Public Administration

Nowadays the web is presented in all fields of our life, from information and service web pages to electronic public administrations (e-government). This makes that users are a heterogeneous and multicultural public, with different abilities and disabilities (Visual, hearing, cognitive & motor impairments).

These characteristics represent a huge challenge if we hope to provide access to all possible users, specially if the intention is to fulfill web accessibility guidelines WCAG 1.0 y WCAG 2.0 (Web Content Accessibility Guidelines) [ACG08] of the WAI (Web Accessibility Initiative).

Web accessibility aims at enabling all users to have equal access to information and functionalities on the web. More specifically, Web accessibility means that people with all disabilities can perceive, understand, navigate, and interact with the Web.

To assure web accessibility, several studies have suggested numerous evaluation methods [BRA06], [VIG07] as a mean to verify, measure and certify the fulfillment of accessibility guidelines and therefore to supply full accessibility to disabled people ensuring that laws are being upheld. Many of these evaluation methods were implemented, thus creating a number of automatic tools to simplify the evaluation process and by that way providing a technical infrastructure for all software developers to guarantee minimal access.

Despite these technical facilities and the fulfillment of laws and moral obligations towards disabled persons, unfortunately many public administrations and people representations still doesn't apply the minimal accessibility condition for their websites.

In many cases they are the ones whom established these laws as we will see next in this paper analyzing the Spanish Senate website.

The Senate of Spain is the upper chamber of the Parliament and a constitutional body. Since 2002, several decrees and laws provide that the website of the Public Administrations must be accessible, thus ensuring universal access and applying the no discrimination statements of European Union. For example, the Royal Decrees 1494/2007 [BOE07a] & 56/2007 [BOE07b] states that the Internet sites of public administrations must meet at least AA level of WCAG 1.0. However, as we will see next in the analysis of the Senate's website, the page is full of errors that prevent the information to be accessible. Therefore, the Senate breaks the same laws they create. Or as the Spanish proverb say, "Do as I say, not as I do."

2.1. A BACKGROUND ABOUT WEB ACCESIBILITY

Concern about websites accessibility has been growing steadily since the mid-1990s. This cause has been supported by researchers, community organizations, web standards bodies, and governmental agencies. This broad community has attempted to raise awareness of accessibility issues and to encourage accessible design practices through a number of different methods, laws and techniques. Web standard organizations have developed technical guidelines that attempt to codify accessible design techniques, WCAG 1.0 & WCAG 2.0 are the most important guidelines developed in 1999 and 2009 respectively. Researchers by its turn, have created automatic evaluations tools for these guidelines such as ATRC [WAC11], A-Prompt [WAV11], WAVE 4.0 [WAE11], EvalAccess 2,0 [WST11], TAW [AWA11], and Cynthia Says [EST11] to assist web developers in evaluating accessible web sites. On the other hand, government organizations in some countries implemented legal requirements for accessible web pages [WAM11].

WCAG defines three levels of accessibility (A, AA, AAA) and provides a set of checkpoints or success criteria for each level. A web page must satisfy all priority A checkpoints or criteria to be considered minimally accessible. Web developers may implement priority AA and priority AAA checkpoints or criteria to provide increased accessibility for users.

Although web accessibility guidelines such as WCAG are designed to be easy to follow, verifying a site's accessibility can be a time-consuming task and needs expertise evaluators validate it. For that reason, several researches like [BRA06], [VIG07] have proposed methods to support evaluators.

These methods are divided into two types: the analytical and the empirical methods. These methods estimate the accessibility of an interface so as to validate, certify or compare it to other similar systems. Automatic tools are the most useful analytical methods due to its quick results and ease of use.

These tools may assist developers in the creation of accessible web sites, but may not be able to identify all accessibility issues; several comparisons between them show quite contradictory results [DIA09], [THA06], on the other hand, the other analytical methods mostly used like manual revisions also does not guarantee full accessibility [BRA08] and depend largely on the evaluators experience and the adopted guidelines.

For this reason, automated tools are often used in combination with some type of manual evaluation (Expert evaluation) and empirical methods like user test method [MAS10], which are strongly recommended to be applied in order to guarantee the full accessibility to all disable people [DRC04].

2.2. LEGAL ASPECTS CONCERNING WEB ACCESSIBILITY

Governments worldwide have also begun to consider the application of web accessibility to electronical and digital products [WAM11].

In the United States, Section 508 of the Rehabilitation Act of 1973 [SEC07] stipulates that all electronic information produced by federal agencies must be

accessible to people with disabilities. Section 508 also provides a set of mandatory accessibility checkpoints for federal government web sites.

The United Kingdom also adopted laws and legislations concerning web accessibility, the [DDA95] were introduced to end discrimination against disabled people.

The European Union in its term, adopted many important legislations concerning web accessibility especially that such laws comply with the principle of non-discrimination set up in the Treaty on the European Union, eEurope 2002, eEurope 2005, i2010& Digital agenda for Europe 2010-2020 [DIG10] Action plans were launched in 2000, 2002, 2005 and 2010 respectively.

Recently The EU adopts WCAG 2.0 guidelines and level AA as mandatory for all public sites, they also boosts and pressures all member countries to have a continuing development policies related to people with disabilities and web accessibility.

Particularly in Spain, since 2002, several decrees and laws like 1494/2007 56/2007, and 49/2007 [BOE07c] provide that the website of the Public Administrations must be accessible at least with level AA of WCAG 1.0. Violation Of these rules are severely punished by 49/2007 decree.

2.3. SPANISH SENATE WEBSITE ANALYSES

When we initially decided to assess the Spanish Senate website, we believed that we are going to face an inclusive, accessible, modern designed web site and not an old non professional one, since the Senate is the Spanish governing body of legislative policies regarding web accessibility and in general the promoter of rights for all disabled persons.

Initially our preparations were focused to fit the implementation of a comprehensive empirical evaluation methodology in order to see with details which degree or level of accessibility this site meets, but when we connect to the site our surprise was unbelievable, we thought that the site was under hackers attack or something like that. Only after some checks we recognized that the Spanish Senate is the first public legislative representation in breaking the above mentioned laws, which

means his proper laws and decrees. The penalty for the violation of the above mentioned laws was established by the law 49/2007 of 26 December which severely punishes public administrations that doesn't comply with a fine up to 1 million euros, so should the Spanish Senate punish him self and pay this fine?. Following we see the applied method of the accessibility evaluation process.

Applied Method

As a consequence of the non-fulfillment of the above-mentioned decrees and laws by the Spanish Senate website, we have had to start our analysis from the initial steps of any evaluation method, which means from the manual inspection of code and automated evaluation tools. In this approach we centered our effort in the analytical methods and the tools that support this methods leaving empirical evaluation as exposed in [22] for the next step, that means after the Spanish Senate carry out the modernization of his proper website satisfying accessibility rules.

Our applied method was divided into 2 steps [SSE10a, SSE10b]:

1. **Pre-analysis Evaluation Step**
   - Localization of the Senate's real website, thus assuring its identity.
   - Navigating some pages of the site to have a general idea.
   - Appling available software (ex. Web developer tool) to revise cleanliness of used HTML language and image volume used in the site.
   - Comparison between the actual web and latest versions by using an automatic service system (ex. Archive.org).
   - Applying text browsers (ex. WebbIE) to verify if information is accessible and equivalent to that provided by a graphical user interface browser.

2. **Automatic Evaluation Stage**
   - Validation of mark-up language using HTML Validation Service of W3C.
   - Validation of CSS style sheet using CSS validation service.
   - Automated Accessibility evaluation using TAW software.

Pre-analysis evaluation step

First of all, we have to verify and make sure that the domain name senado.es really belongs to the Senate of Spain, for that:

- We access the page www.nic.es to verify whether the site is registered under senate property.
- We found in the registered data that this domain name uses REDIRIS DNS servers.
- REDIRIS is the academic and research Spanish network which provides advanced communications services to the scientific community and public administrations.
- To check that, we access www.rediris.es and under the link *SOBRE REDIRIS* > *INSTITUTOS* > *LISTA*, we localize that the Spanish Senate belongs to REDIRIS which means that the website under analysis is the official website of the senate.

Starting the analysis of the homepage, the first thing that causes a very bad impression upon entering the page was the wasted space that we found; over 60% of the page is completely empty, this is because the site used a form of design called fixed design, in this case it is designed for a screen resolution of 800*600 pixels, this resolution was very normal before 10 years but now nobody use it. Secondly, upon navigating different pages we found different presentations styles which are non-coherent between each other, for example visiting *Saludo Del presidente*, *Novedades* and *Sala de Prensa* links; we identify directly the two following problems:

- Non-coherent presentation style.
- Non-coherent navigational mechanism.

The Spanish Senate's website looks like as if it belongs to another era. It seems taken from the trunk of memories. So we decided to check from when the senate's website exists and its evolution. For that purpose we accessed www.archive.org and used wayback machine service which allows us to see how this site was in the past. The returned list shows 482 old versions of the Senate's site listed from 1998 until 2011. Comparing them, we easily noticed that the similarities are many, therefore, there were no important changes done for the over 10 past years.

The second issue to treat was the main accessibility problems of the page, for that purpose, we used web developer tool bar and Webbie text browser [SRB11]. Through the first we could highlight the main structure of the page, which provides us an idea about practiced technical issues. The main accessibility barriers identified were the use of:

- Frames: Non-recommended and cause serious accessibility problems.
- Images : although to the naked eyes text appears, texts link are really images.
- Animated links: scandalous feature, used in *Novedades* link.

Through Webbie we could simulate vision disabled persons accessing the web, the main problems we faced was the lost of almost all important links due to:

- Exaggerated use of Image-links: All the home paged formed by images.
- Non-labeling of Image-links: Only 11 links labeled out of 28 and in an insufficient way, this means that's they know how to do but they didn't.

Instead of offering accessible website, the Senate computer service provided a text-only version for disabled people, although offering a ¨text-only version¨ is a bad idea and it's not recommended by W3C, this solution wasn't effective and doesn't offer accessibility because the link wasn't labeled and therefore vision impaired people can't localize it.

The last step of this pre-analysis stage ends with the revision of HTML source code. We select the only-text page for the revision purposes. The first mistake we found and surprise us was the following:

- Incorrect use of HTML code: expressed many times in the page and represented in the mix between tags and attributes in uppercase and lowercase.
 tags used between two lists items which cannot be done usually.
- Use of strongly discouraged HTML code: some nonsense use of tags such as the use of <Font> tags which are discouraged from years, especially if its use is to give size for a text and create titles. Instead, headings tags like <H1>, <H2> must be used, which are much more useful and allow greatly improve the accessibility of a web page [HEA11].

The following are the checkpoints that were unfulfilled: 1.1, 3.3, 3.5, 11.4, 12.1, 12.2, 13.4 & 14.3.

Automatic evaluation step

The first step in this section is to check the validity of HTML language, for that purpose we used the W3C HTML markup validator service and WDG HTML Validator [WDG11]. The returned results shown that the document can't be check due to unrecognized DOCTYPE definition. The declared DOCTYPE is obsolete and doesn't fit W3C accessibility recommendations.

Our next step was the checking of the validity of CSS language, but this is useless because although it is difficult to believe, the site is developed without CSS!

To conduct a rapid assessment of accessibility, the next step was the use of an automated evaluating tool, such as TAW . Selecting Priority AAA compliance to check the main homepage, the analysis gave us back the following report:

Table 2.1. Automatic accessibility evaluation results

Priorities	Automatic errors	Manual errors
Priority 1 or A	41	31
Priority 2 or AA	25	53
Priority 3 or AAA	33	22

Following are some of the most important accessibility faults detected during this step and their respective violated criteria:

1. None defined character set <CHARSET>: This can cause serious problems displaying information.
2. None defined CSS style sheet for layout presentation.
3. None defined HTML doc. Language: It must be defined through language attribute ¨Lang¨ and not through <CONTENT> tag.
4. Wrong use of maps and Images: Maps used to represent simple link-texts and without providing descriptions through <ALT> & <LONGDESC> tags, also in some occasions maps used to represent only one active zone.
5. Wrong use of table for layout structure: Another committed error is the use of tables to present page content inside columns.
6. None defined table's summary attribute.

The following are the checkpoints that were unfulfilled: 1.1, 3.2, 3.3, 4.3, 5.1, 5.3 5.5, 5.6 & 11.1.

2.4. CONCLUSIONS

In this paper we present a comprehensive accessibility analysis of an important European public representation website, such as the Spanish Senate website. We have shown that achievements of web accessibility in the technological and legislative fields still not materialized in the practical field, it is still a problem for the top public administrations to comply with accessibility guidelines, which suppose to give the example and be the first in applying their proper legislations and decrees.

The analysis results present clearly that the Spanish Senates website is an old non-professional designed site and overall an inaccessible website for all disabled people. We have found a significant level A accessibility problems. We also conclude that Senate's computer service knows well how to apply accessibility rules in some places, but unfortunately they didn't do it completely and for the whole site.

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