

# Iberoamerican Observatory of Web Accessibility

## A Benchmarking and Educative Tool

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**Abstract.** The web content accessibility guidelines (WCAG) were first published 15 years ago. Since then, there has been a lot of progress in web accessibility, but much work is still needed to reach good levels of accessibility. It is therefore important to measure the degree of accessibility of current websites and the rate of improvement. There have been several studies on the implementation of web accessibility in Europe and the world, but such studies are unstable, with a methodology and sample that changes from year to year. The Iberoamerican Observatory presented in this paper aims to correct this situation, coordinating the work of the observatories of the different participating countries, so that all use the same methodology and a consistent sampling and data structure. Thus, results can be compared within the same country and with the other countries of the region.

**Keywords:** Web Accessibility, Review, Benchmarking, Monitoring.

## 1 Introduction

In 2014 we celebrate 25 years of the web, and 15 of the publication of WCAG 1.0 (Web Content Accessibility Guidelines) [1] that indicate how web content has to be to provide equal access to all users, including persons with disabilities.

The WCAG have become an internationally accepted standard as the basis of accessibility legislation in most countries [2] and version 2 (WCAG 2.0) [3], published in 2008, has also been published as the ISO / IEC 40500:2012 standard [4]. However, evidence indicates that neither the regulations nor the existing standards are being properly implemented in most websites, which still present significant barriers for users with and without disabilities.

Studies on the implementation of web accessibility criteria in Europe and the world are published regularly (i.e. [5,6]), but such studies are partial and unstable, with methodologies and sampling changing from year to year. The Iberoamerican Observatory aims to correct this situation, coordinating the work of observatories of the

participating countries, so that all use the same methodology and consistent sampling and data structures. Thus, results can be compared within the same country and with the other countries of the region. In addition, the evolution over time can also be measured.

The Observatory will serve a dual purpose. On the one hand, it will provide clear and precise information about the evolution over time of the conformance to the subset of success criteria and sufficient techniques that can be automatically checked (not only showing accessibility errors but also highlighting good practices). On the other hand, it will fulfil a pedagogical function, as it will provide those in charge of each country's websites with specific guidelines on how to check for and repair the errors found, based on the combination of an internal communication system and outreach public activities.

## 2 Related Work

In America's Spanish-speaking and Portuguese-speaking countries, large scale accessibility monitoring projects are hard to find. In Spain, there are various observatories for IT [7], disability [8] and Public Administration [9]. One example is the e-Government Website Accessibility Observatory, set up in 2010 by the General Directorate for the Promotion of e-Government. The activity of this Observatory ended in 2011 and its reinstatement for 2014 is currently being considered. Unfortunately, most of the observatories do not publish information enough about their investigations, or they publish sector-specific studies that do not have continuity over time.

In Portugal, Unidade Acesso of Fundação para a Ciência e a Tecnologia [10] has been monitoring Public Administration websites since 2006, but without releasing the benchmarking directories. This activity has resulted in the publication of four reports about the Portuguese Central Public Administration in 2002, 2003, 2008 and 2010.

Out of the Iberoamerican area, the most immediate antecedent is the European Internet Accessibility Observatory (EIAO), founded in September 2004 and active until 2008. In that year they published a report with their results [11]. EIAO was part of a cluster of European projects on web accessibility, WAB CLUSTER [12]. After EIAO, the eGovMon [13] project was carried out in the Nordic countries, and it is intended to be continued in the European Internet Inclusion Initiative project (EIII) [14].

Some other projects have been carried out, such as SMART 2008-0066 "Monitoring eAccessibility in Europe" [15]. This activity was commissioned by the European Commission as a follow-up to the study "Measuring Progress of eAccessibility in Europe" (MeAC) [16], developed during the period 2006 - 2008. One of the goals of the SMART 2008-0066 activity is to draw up an annual report, taking as a starting point the data provided by the MEAC study. The results have been two reports published in 2010 and 2011.

Recently, a Study on Assessing and Promoting E-Accessibility [6] was published. It is a study prepared for the European Commission DG Communications Networks, Content & Technology, whose main aims were to describe the extent of e-accessibility across the EU27 countries and some third countries, as well as the policy efforts that have emerged in this area.

At present, the main problem is that there are no means of obtaining accurate data on the evolution of web accessibility, neither in Europe nor the rest of the world. This is due to various reasons: documentation and databases disappear; reports do not compile all the desired and necessary information to make a follow-up; samples are not constant; methodologies and criteria change from one report to the next, etc.

The conclusion of the analysis of related work is that the existing projects of large-scale web accessibility benchmarking have so far failed to reach the goal of showing the evolution of web accessibility in a region, given the difficulties of comparing different reports that do not share sampling nor evaluation methodologies. We believe that part of the problem is the need of a large amount of resources for launching and maintaining the activity of transnational web accessibility observatories. That is the reason why our proposal distributes the workload into national observatories that are coordinated in Spain by the Sidar Foundation.

### **3 Observatory Needs and Objectives**

The publication of WCAG 1.0 in 1999 [1] led to many changes. Proof of those changes are the large number of legislation's modifications adopted across the Latin American countries [2] that intend to enforce compliance to WCAG 1.0 regulations. Even so, the advances over the region in WCAG conformance are partial and uneven. And, as described above, there is no reliable data collected in Latin America, Europe or globally, that allows an objective vision.

The sporadic publication of lack-of-compliance reports is not enough; to really encourage improvements in WCAG compliance, it is necessary the publication of regulated and standardized reports on a regular basis. Such publications should be on publicly accessible media, not only on specialized magazines.

In addition, if such an observatory is to become an advocacy tool and an educational instrument for more and better accessibility, it is necessary to complement the information on the degree of accessibility compliance with qualitative identification of problems found to enable point solutions. It is important to know the current degree of accessibility, but it is even more important to know how to correct the situation and exit the non-compliance status.

Over the 15 years of the WCAG 1.0 history, many attempts were made to explain the difficulties of a wide adoption of the regulations. Given the uneven format and periodicity of the reports, it is not possible to obtain a conclusion based on them. A regularity on publication as well as a standard methodology of the tests performed would mean the feasibility of benchmarks among different sectors, countries or in-country organizations.

Therefore, the main aims of this Observatory are: (1) to preserve regularity in the methodology, sampling and periodicity of the evaluations; (2) to enable the creation of reports with manual revisions by experts to achieve more detailed results; (3) to enable the creation of reports with usability tests with people with disabilities of some pieces of content and technologies of Web content contributing to arise of new techniques of accessibility design; (4) to create culture about good practices in the evaluation and repair of accessibility problems; and (5) to make public campaigns about the most common errors and their resolution.

## 4 OIA's Methodology

The Iberoamerican Observatory of Accessibility (Observatorio Iberoamericano de la Accesibilidad - OIA) has established a network of autonomous observatories that apply a common methodology, using an even set of data collection and producing an even set of measurements and reports.

Each national observatory is responsible on the selection of statistical marks over its own country, and the resulting data is collected and grouped on predetermined categories named following the European Network for Administrative Nomenclature (ADNOM) [17].

National observatories have to follow a common approach: they have to report the result of the test performed; the test has to include all the sub-categories of the 10 categories previously defined; the test is performed on at least 10 pages on every site; the test has to include the HTML source to enable comparing automatic results and making complementary studies. This way, the results obtained can be compared, measurements are consistent and reports are meaningful.

To guaranty the uniformity of calculations, the observatories are spread among different web servers while every one of them makes use of a specifically designed application that produces a metric (or accessibility score). Reports are updated on a monthly basis and every single observatory produces its own statistical results to be collected on the OIA so as to produce global statistics.

### 4.1 Metric

The calculations are performed using an automatic evaluation tool specifically created for OIA, based on a previous tool called eXaminator [18]. The tool uses a quantitative metric that indicates a ratio of successful tests. This metric is an indication of the degree of accessibility that users will experience on a site. The metric obtained, quantified on a 1 to 10 scale, is used to compare the results and variations of tests, and to record the variations upon time.

The evaluation algorithm of eXaminator is based on 96 individual tests related to techniques or failures of WCAG 2.0. The results of each test are then averaged to obtain a general score for each page. Out of those 96 tests, 60 are known to offer a large accuracy upon automatic evaluation test, and are used to identify errors that, along with the page's evaluation score, constitute the main source of statistical data.

### 4.2 Categorization

The OIA presents the challenge to obtain comparable reports from public administration websites of different Latin American countries. There is a lot of diversity in the structure of national governments, the terminology of public functions and even the political way of governments. Even the concept of public administration differs from one country to another. For instance, in Argentina, neither the legislative power nor the justice power are included as part of public administration. In addition, we have

found significant differences in the organization of public administration websites, complicating the search for equivalent sites for comparison.

Such remarkable differences, lead us to define a common glossary and a common classification system that enables a proper classification of the web pages that are part of the sample in each country.

For these purposes, OIA has adapted the nomenclature system specified at the CWA 15526 European Network for Administrative Nomenclature (ADNOM) [17], which is based on the COFOG (Classification of the Functions of Government) [19] that was developed in 1999 the United Nations.

OIA can describe websites based on function, organism and jurisdiction. The values for function and organism are based on the ADNOM terms and the terminology for jurisdiction has been specifically developed for OIA. A document has been produced to explain the terminology and its application to 3 different Iberoamerican countries with different government forms.

In addition to a common nomenclature, OIA also includes a definition of a common set of websites to be monitored, so that results can be compared. Also, each country can freely select additional sites to be tested and monitored for their own needs.

## **5 From eXaminator to OIA: Lessons Learned**

Since 2006, the eXaminator tool has been widely used on large-scale monitoring projects and its inner algorithm has been modified according to such direct experiences. The first version of eXaminator was based on WCAG 1.0 and was used in Portugal. And updated version, AccessMonitor, was based on WCAG 2.0.

AccessMonitor can evaluate single pages, but its main capacity is to perform large-scale benchmarking of Portugal's public administration sites. The test results are published only among the responsible individuals (site owners) of the evaluated sites; the reports are then incorporated to fill the reports published by Unidade Acesso.

The authors of AccessMonitor published in 2010 the Web Accessibility FrameWork [20], a demonstration tool that intends to demonstrate how large-scale benchmarking could be applied to improve the accessibility on the web.

In 2012, based on the idea of the Web Accessibility FrameWork, the first two national observatories were created in Argentina [21] and Mexico [22]. Both of those projects were the launching platform for recommendations and improvements to the system later used by the OIA.

Even though there were operational issues on those two attempts that forced the discontinuation of the projects, the experience was valuable and helped to confirm the real usefulness of continuous evaluation that appears after continued work.

A hard lesson learned was that an observatory is an ongoing project that takes its time to shows its benefits. In addition, it requires a large amount of economic and technical resources to be run. The authors expect to take advantage of these previous experiences to avoid the difficulties in reaching the full potential of OIA.

## 6 Expected Impact and Contributions to the Accessibility Field

There have been several attempts to define metrics that represent the degree of conformance to WCAG ([11], [23,24,25,26,27,28,29]). In addition the latest Working Draft of the Website Accessibility Conformance Evaluation Methodology (WCAG-EM) [30] prompts for the use of a score card on manual revisions.

OIA uses a new metrics similar to the one used by the AccessMonitor [31], but improved to facilitate large scale comparisons and without the intention to provide relationships between the obtained score and the accessibility level compliance.

OIA can contribute to the creation of better instruments to observe and compare accessibility, which is one of the main issues on proposed new European Directive on the accessibility of public sector bodies' websites [32] that could be enforced during 2014.

The Observatory has recently appeared and it is soon to talk about its impact. However, the experiences of the Sidar Foundation and the Portuguese government on accessibility awareness campaigns point to expecting a strong positive impact of OIA.

As an example of the results of the performed tests we have observed that some pages frequently disappear because of URL changes. This is an issue for the user and for the Observatory. Hence, the observatory will contribute to eliminate such a bad practice by informing its members about content negotiation as a way to ensure the localization of resources both to the general public and to the Observatory itself, so that stable analysis can be generated and data comparison can be achieved over the years. The Observatory will also allow addressing other studies, performing analysis of global data, developing joint projects in all countries involved and measuring the impact of these projects.

An especially attractive feature of OIA is that the results are shown in a graphical way, making easy to understand the statistical data. Even more, information is offered about which type of user results positively or negatively affected for any particular result and to what extent. This will end up on a better comprehension of the impact that a particular -easy to solve- failure can have. Our hope then is that this helps to increase awareness and help developers to increase the accessibility of their websites.

## 7 Conclusions and Future Work

After 15 years of the WCAG 1.0 publication, no global wide data can be obtained regarding accessibility conformance. There only have been some isolated and non-constant reports. The lack of consistent and stable data makes it difficult to assess the validity of the reports about web content compliance, thus reducing their reliability and impact.

An observatory such as OIA is not able to perform a complete measurement of conformance (as manual evaluation is required for that), but it can provide a reasonably good knowledge of the current and future state.

It is still uncertain what the actual contribution of OIA will be in the general improvement of accessibility, mainly because never before this information was

available in a standardized and constant form. However it is expected to become a platform that will enable new projects and research that propose specific actions in favor of accessibility.

As per future work on the Observatory, we are currently working on the generation of machine-readable reports, using the EARL format [33], as was already available on the sister tool HERA [34]. We are also working on a system for offering information related to the implementation of good practices when creating mobile applications that overlap general accessibility guidelines.

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