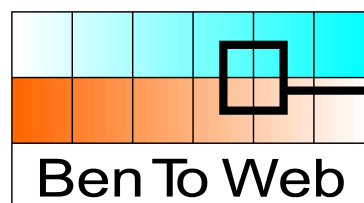


**Benchmarking Tools and  
Methods for the Web  
(FP6—004275)**



Sixth Framework Programme  
Information Society Technologies Priority

## **D1.3 Final Report (Publishable final activity report)**

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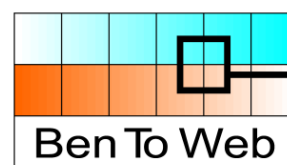
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# 1 Executive Summary

This document is the publishable final report of the project BenToWeb (Benchmarking Tools and Methods for the Web, contract no. 004275), a research project co-financed by the Information Society Technologies Programme<sup>1</sup> of the European Commission priority of the Sixth Framework Programme (Action Line e-Inclusion). The document introduces the objectives, the project partners, the degree of achievement and the main project results. Further information can be found in the project Web site at <http://bentoweb.org/>.




Benchmarking Tools and Methods for the Web		
<ul style="list-style-type: none"> <li>Home Page [0]</li> <li>Description</li> <li>Partners [2]</li> <li>Documents [3]</li> <li>Tools [4]</li> <li>Test Suites [5]</li> <li>News/Events [6]</li> <li>Contact [7]</li> </ul>	<h2 style="margin: 0;">Project description</h2> <p>BenToWeb is a project within the <a href="#">Web Accessibility Benchmarking (WAB) Cluster</a> aimed to support the European public and private sector to implement the recommendations of the <a href="#">eEurope 2005 Action Plan</a> by providing new software modules and methodologies that satisfy some of the accessibility recommendations of the <a href="#">Web Accessibility Initiative (WAI)</a> of the <a href="#">World Wide Web Consortium (W3C)</a>, which are not analysed by existing tools due to their inherent complexity.</p> <p>BenToWeb will support the objectives of the Cluster in regard to the creation of a validated methodology to test Web sites. Furthermore, the project will:</p> <ul style="list-style-type: none"> <li>• Support the Web Accessibility Initiative (WAI) to develop further the <a href="#">Evaluation and Report Language (EARL)</a> under the umbrella of the <a href="#">Evaluation and Repair Tools Working Group</a>, as well as several related activities targeted to the production of resources to combine reports from different Evaluation and Repair Tools.</li> <li>• Support the relevant WAI Working Groups in the development of complementary documents of the second generation of the <a href="#">Web Content Accessibility Guidelines</a>, such as technology-specific techniques documents and accessibility test-suites for key W3C recommendations. In particular, XHTML and CSS Test Suites have being developed for the <a href="#">Web Content Accessibility Guidelines 2.0</a>, and the Consortium is actively supporting the <a href="#">WCAG 2.0 Test Samples Development Task Force (TSD TF)</a> for the development of WCAG 2.0 test materials.</li> <li>• Investigate further the feasibility of automatic testing procedures that include issues like colour-contrast, low-vision, colour-blindness and consistency of navigation elements, and develop implementation modules for user testing.</li> <li>• Develop new testing modules based upon modern language technology from Computational Linguistics, to control the syntactic-semantic properties of documents as required by accessibility guidelines.</li> </ul>	<div style="text-align: center;">  <p><b>News</b></p> </div> <ul style="list-style-type: none"> <li>◦ <b>March 1st, 2007:</b> <a href="#">Evaluation of text readability started.</a></li> </ul> <div style="text-align: center;"> <p><b>WAB Cluster</b></p> </div> <p>BenToWeb is one of the projects belonging to the WAB Cluster. See more information in the <a href="#">Cluster Home page</a>.</p>



Figure 1.1: BenToWeb Home Page.

<sup>1</sup><http://cordis.europa.eu/ist/>

## 2 Introduction

BenToWeb aimed to support the European public and private sector to implement the recommendations of the eEurope 2005 Action Plan<sup>2</sup> by providing new software modules and methodologies that satisfy some of the accessibility recommendations of the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C), which were not analysed by existing tools due to their inherent complexity. The project existed under the umbrella of the Web Accessibility Benchmarking (WAB) Cluster established by the European Commission services.

The project objectives were the following:

- To support the Web Accessibility Initiative (WAI) to develop the next generation of the Evaluation and Report Language (EARL) under the umbrella of the Evaluation and Repair Tools Working Group.
- To develop and assess test-suites for benchmarking of Evaluation and Repair (E&R) tools for Web accessibility in relation to Web Content Accessibility Guidelines 2.0. This activity was also realised within the Evaluation and Repair Tools Working Group.
- To support the development of accessibility test-suites for Web Content Accessibility Guidelines 2.0 for selected W3C recommendations, such as (X)HTML and CSS 2.x, as well as related materials with information on accessibility features of those technologies, in coordination with relevant WAI WGs (WCAG, ERT Working Groups).
- To support the relevant WAI Working Group in the development of complementary materials to the second generation of the Web Content Accessibility Guidelines.
- To investigate further the feasibility of automatic testing procedures that include issues like colour-contrast, colour-deficiency and consistency of navigation elements. To develop implementation modules for user testing.
- To include modern language technology from Computational Linguistics for controlling syntactic-semantic properties of documents as required by given guidelines.
- To support the activities of the Web Accessibility Benchmarking (WAB) Cluster and enhance the synergies between the participating

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<sup>2</sup> [http://europa.eu.int/information\\_society/eeurope/2005/text\\_en.htm](http://europa.eu.int/information_society/eeurope/2005/text_en.htm)

projects. To support the development of the Unified Web Evaluation Methodology (UWEM), which contains a complete methodology for the evaluation of web sites for WCAG 1.0 conformance.

## 2.1 Project Partners

- Fraunhofer Institute for Applied Information Technology FIT (Germany), project coordinator  
<http://webcc.fit.fraunhofer.de/>
- Katholieke Universiteit Leuven Research & Development (Belgium)  
<http://www.docarch.be/>
- University of the Aegean, Department of Product and Systems Design (Greece)  
<http://www.syros.aegean.gr/>
- University of York, Department of Computer Science (United Kingdom)  
<http://www.cs.york.ac.uk/>
- University of Linz, "integriert studieren - integrated study" (Austria)  
<http://www.integriert-studieren.jku.at/>
- Stichting Bartiméus Accessibility (The Netherlands)  
<http://accessibility.nl/>
- ISdAC International Association (Belgium)  
<http://www.isdac.org/>
- FernUniversität in Hagen (Germany)  
<http://pi7.fernuni-hagen.de/>

## 2.2 Contact

The contact point for any query regarding the project is:

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### 3 Project execution

The initial set of objectives of the project were very ambitious, not only because of the complexity of the research objectives, but because of the coordinating challenge with the actors involved, especially with the different Working Groups (WGs) of the Web Accessibility Initiative.<sup>3</sup> To facilitate this cooperation, different collaboration channels were established, from direct participation in the WGs, including editorial tasks of key documents, to ad-hoc Task Forces with strong support from the project.

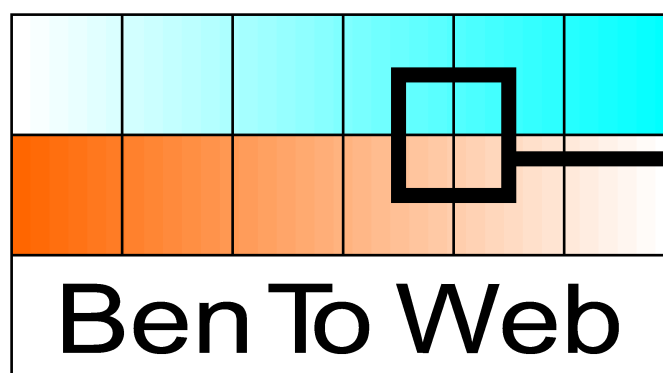


Figure 3.1: BenToWeb logo.

It can be asserted that the degree of fulfilment of the objectives, both on the technical and coordination levels, are very high. The main outcomes of the project are:

- A set of test suites<sup>4</sup> for WCAG 2.0 Web conformance testing. The latest test suite is being progressively adopted by W3C with the review of the Test Samples Development Task Force. These test suites provide a reliable benchmarking environment for evaluation and repair tools, which could be used in public procurement policies.
- A set of related tools to the test environment, like the Test Case Description Language (TCDL),<sup>5</sup> from which BenToWeb provided an adapted version for W3C.
- A set of advanced drafts of the Evaluation and Repair Language, together with a set of associated tools.<sup>6</sup>

<sup>3</sup><http://www.w3.org/WAI/>

<sup>4</sup><http://bentoweb.org/ts>

<sup>5</sup><http://bentoweb.org/tools>

<sup>6</sup><http://www.w3.org/WAI/ER/Overview.html#deliv>

- A set of advanced modules that permit the automatic verification of complex accessibility requirements like language simplicity, colour-contrast, colour-deficiency and consistency of navigation elements. The modules have been verified by thorough user testing, and some of them will be commercialised in coming versions of Web compliance tools like imergo<sup>7</sup> in the spring of 2008. These tools have significantly advanced the state-of-the-art in the area of Web Compliance tools for industrial Web applications.
- A complete testing framework that allows the development, verification and analysis of test cases, including large scale validation with end users. The framework is known by its two components, Amfortas and Parsifal (see Figure 3.2).

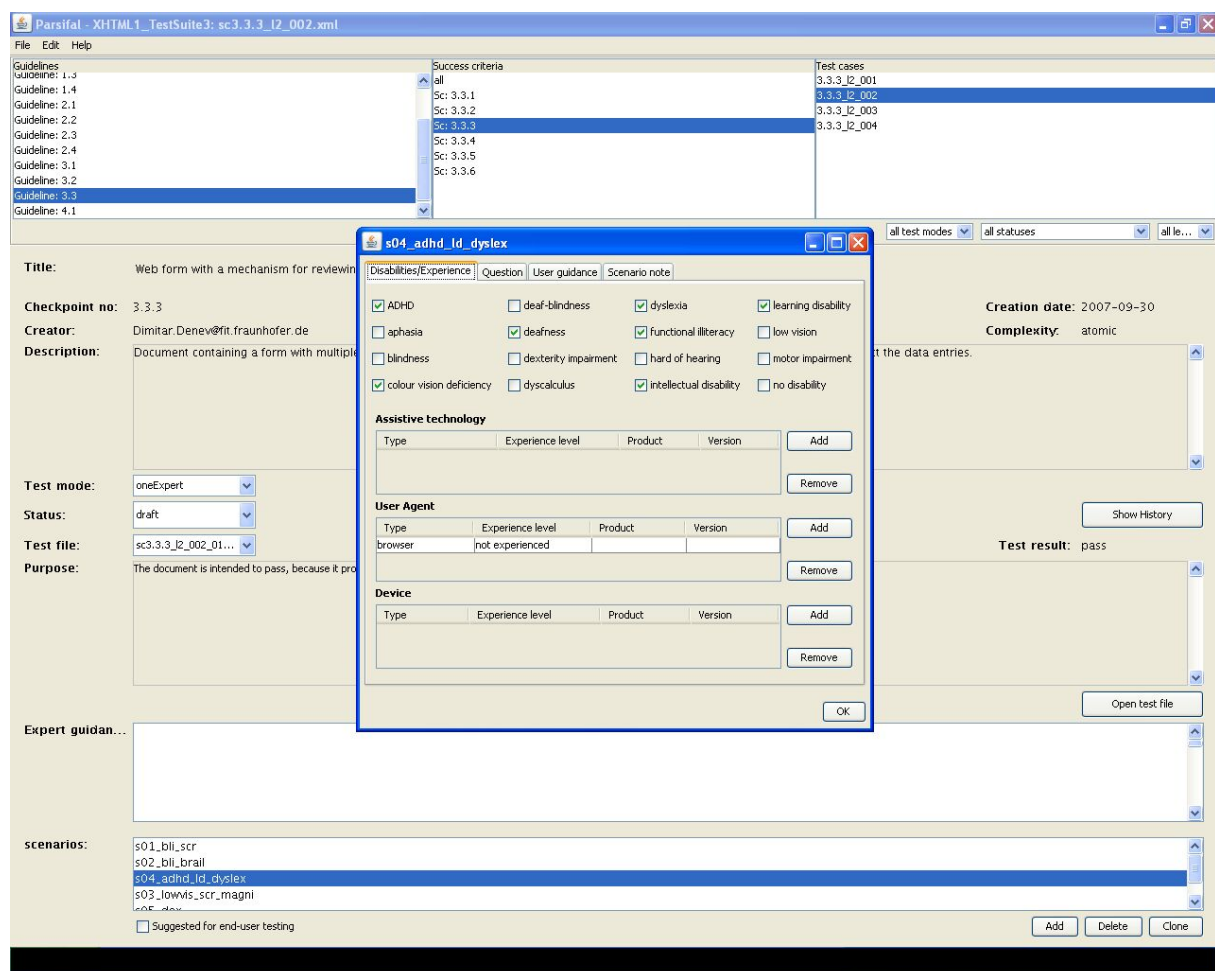


Figure 3.2: Screenshot of the GUI from Parsifal.

<sup>7</sup><http://imergo.com/>

## 4 Dissemination and use

This section provides a publishable summary of each exploitable result of the BenToWeb project.<sup>8</sup>

### 4.1 Accessibility evaluations

The BenToWeb partners offer accessibility consultancy in aspects like: development of tools and testing components, usability evaluations, accessibility evaluations, evaluation of testing tools, etc.

The contact partners are:

- **Contact:** Dr Carlos A Velasco  
Fraunhofer Institute for Applied Information Technology FIT  
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- **Contact:** Prof. Klaus Miesenberger  
University of Linz "integriert studieren - integrated study"  
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Stichting Bartiméus Accessibility  
Utrechtseweg 84, 3702AD Zeist (The Netherlands)  
<http://accessibility.nl/>

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<sup>8</sup>For a complete list of scientific publications see: <http://bentoweb.org/pubs>



- **Contact:** Tony Verelst  
ISdAC International Association  
c/o IGL, Boddenveldweg 11, B3520 Zonhoven (Belgium)  
<http://www.isdac.org/>
- **Contact:** Prof. Gerhard Weber  
TU Dresden, Fakultät Informatik  
Nöthnitzerstr. 46, 01602 Dresden (Germany)  
<http://www.inf.tu-dresden.de/>

## 4.2 DeLite language analysis module

DeLite is a simplicity language analysis module developed by FUH to analyse Web Resources. The developed prototype offers a wide variety of functionalities in German and English. FUH is looking for partnerships to covert it into a fully commercial product. Market applications are Web authoring tools, Content Management Systems and Evaluation and Repair Tools for the Web.

- **Contact:** Prof. Hermann Helbig  
Intelligent Information and Communication Systems, FernUniversität  
in Hagen  
D58084 Hagen (Germany)  
<http://pi7.fernuni-hagen.de/>

## 4.3 WCAG 2.0 Test Suites

These are a set of test suites for WCAG 2.0 Web conformance testing. The suites are available in the public domain. BenToWeb partners are seeking for partnerships with the public sector and industrial developers to create benchmarking reports on existing Web development tools to determine compliance levels and facilitate to public authorities resources for public procurement policies.

- **Contact:** Dr Carlos A Velasco  
Fraunhofer Institute for Applied Information Technology FIT  
Schloss Birlinghoven, D53757 Sankt Augustin (Germany)  
<http://webcc.fit.fraunhofer.de/>

## 4.4 User Testing Framework

The user testing framework to analyse the developed test suites has two major components, Parsifal and Amfortas. Both components are highly tailored to the selected back-end supporting tools like CVS, Apache

Cocoon, Apache Tomcat, Apache HTTP Server, and especially, TCDL, the Test Case Description Language. Parsifal is an innovative usability tool that aims to support accessibility and usability experts, who may not have a technical background, to access the TCDL metadata of the test case itself and the corresponding test files. Furthermore, the tool allows the expert to design testing scenarios with questionnaires, which are then automatically filtered and parsed by Amfortas –the online back-end– for online testing. BenToWeb partners are seeking for partnerships that will allow the generalisation and further development of these applications to the Web usability domain for online testing.

- **Contact:** Dr Carlos A Velasco  
Fraunhofer Institute for Applied Information Technology FIT  
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