Quick Access to Dictionaries for Blind and Visually Impaired People

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Abstract. Editors publish more and more electronic books on CDR or online. Generally, they use their own databases to create the web pages. But this pages are often not or badly adapted to visually impaired (frames, use of columns…). We propose a tool that use those databases to create accessible web pages for visually impaired readers.

1 A Solution for Quick Access to Dictionaries

The access to dictionaries and encyclopedias is essential at school, university or work. Traditional techniques, like large print or embossed Braille, would result in many bulky volumes making quite uneasy their reading. A few years ago, the emergence of dictionaries on CD-ROM and more recently on the Web, provided new opportunities for the visually impaired to access dictionaries. Nevertheless, in spite of the fact that some of these dictionaries are accessible with Screen Readers, the user interface has to be optimized for improving the reading process.

The general trend in the publishing world is to build databases whose content is independent of the reading interface, using structured languages like XML (eXtensive Markup Language). These well structured source files may be used to create automatically interfaces for visually impaired users.

Indeed, HTML provides a simple and efficient way to create accessible documents in respect of the WCAG guidelines of the W3C/WAI [1][2]. Thanks Cascading Style Sheet (CSS) techniques, people with low vision can use standard screen, with customized fonts, sizes, colors and contrasts. Blind users use Braille devices or speech synthesizers.

In this context, we have developed a tool for creating accessible HTML pages from the database of a popular encyclopedia, published in France by Hachette-Multimedia [3]. The main part of the technical work consisted in developing functions for the conversion of the XML files into adapted HTML files. We have used Web techniques that are supported by most of the different technical environments. The programming language is PHP, used to parse XML files, to interpret each element, and to handle the query dialogues with users. The pages are build on the fly in response to user's requests.

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2 The Reading Interface

The structure of the database used by the publisher has been analyzed, as well as the functionality provided to end-users. Then a model of non-visual interface has been proposed and a moke-up HTML interface was prepared giving access to a few definitions. This moke-up was tested out by 2 blind users. Finally the accessible interface was developed made of 3 main HTML pages : First, the user access a general page for specifying an entry which is sent to the search engine. The answer is a page containing the list of the corresponding articles in the database. The users select an article to receive the full article and links additional information (Fig. 1). Each article starts with a table of contents. Some facilities have been added to improve the robustness of the whole process, like a phonetic search, for example.

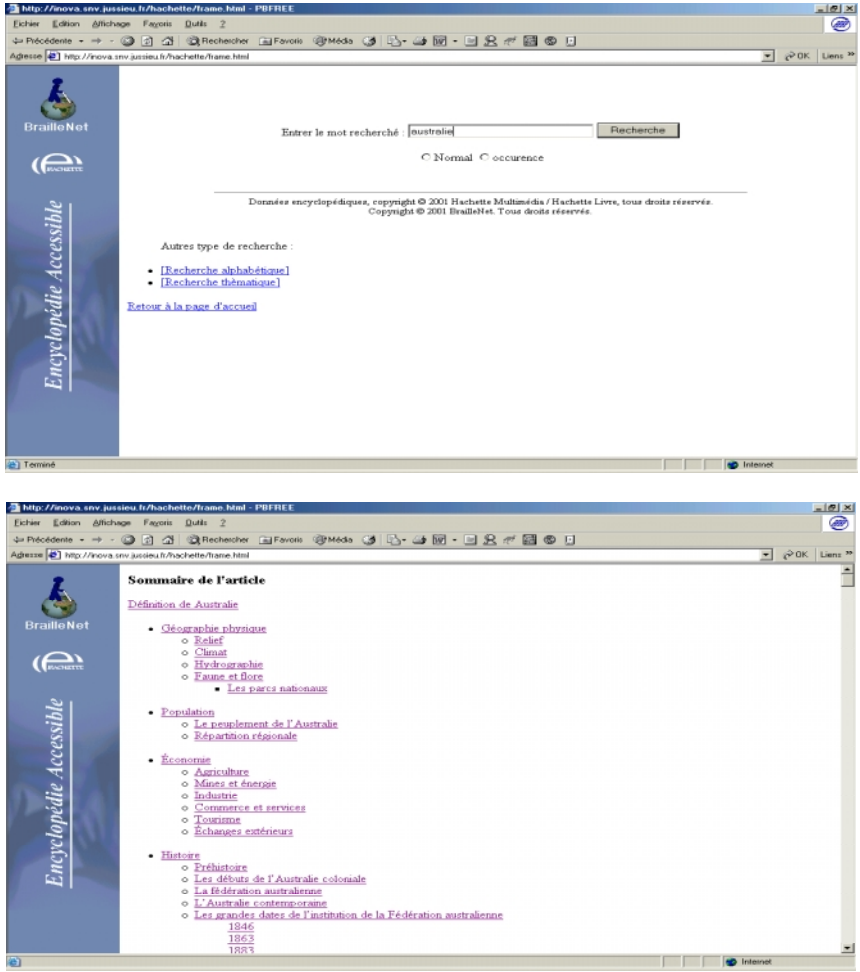

Fig. 1. Adapted User Interface: Examples of a query page and an answer page

To conclude :

- The Encyclopedia has been made available on a Web site for evaluation by a larger panel of users.
- The use of Web techniques guaranties that the end-user can take advantage of any new version of the encyclopedia which the publisher would distribute further, provided the general structure is respected.
- The development work appears to be quite affordable and the principle could be transferable to other contents, and applications. It could fit in with the needs of other handicapped end-users.
- This adaptation work is coherent with the efforts made by the Open E-book Forum [4] toward the normalization of XML formats making possible the access of documents on different platforms.

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