Usability Study of a Medical Resources Web Site.

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Abstract: We present here the usability assessment study of a medical web site dedicated to the Cataloguing and Indexing of French speaking Medical web Sites (http://www.cismef.org). We performed a usability inspection using heuristic evaluation and an empirical usability test using a portable lab. From these results, we draw up a set of recommendations for the re-engineering of the Human Computer Interface (HCI). We conclude on the necessity to integrate usability engineering early enough in the projects lifecycle.

Keywords: Usability, Medical web site, Evaluation.

1. Introduction

CISMeF is a tool dedicated to the "cataloguing and indexing of French-speaking medical web sites" [1], sponsored by the University of Rouen teaching hospital. It is certainly relevant, as a centre for documentation on line, even more so in the context of the "French-speaking Medical Virtual University" (UMVF) [2] project. A large number of French-speaking learners, with varying levels of medical expertise and of experience with the use of the Internet, would thereby come in touch with this particular web site. This paper presents the results of a usability evaluation of the site and of its search engine, which was conducted by the EVALAB, a research laboratory based at the University Hospital of Lille (F).

2. Methods for the evaluation of usability

The aims of the CISMeF evaluation are to get a global view of its usability and more specifically to assess its ease of learning.

There are several categories of methods for measuring the usability of an application.

We performed a Heuristic Evaluation using the "ergonomic criteria for user interface evaluation" by Bastien and Scapin [3]. This is a structured list containing 18 criteria and sub-criteria in all, obtained from the categorization of a large group of heuristics and guidelines. Their validity and reliability have been tested. Scapin et al [4] have recently adapted this list of criteria for evaluating web sites.

We also performed a Usability Test focused on “first time users” who were asked to test the dialog with the interface while doing tasks based on clearly defined scenario. Users were asked to «think out loud» while carrying out these tasks, and the entire activity was recorded.

2.1. Experimentation

Heuristic Evaluation

Four evaluators inspected the CISMeF interface. The category of potential users considered was that of medical faculty students (1st to 4th year), who were presumed to have varying levels of experience with the Internet.

Usability testing.

Subjects: 12 voluntary subjects took part in the evaluation. Their characteristics are:

	First Year students	2nd-4th year students
Novices / Internet	4	2
Experimented / Internet	2	3

Material (portable lab): A converter and a microphone linked to a video recorder were used to record the screens, and thus to register all the subjects’ actions on the computer as well as their verbal expressions.

3. Results.

3.1. Results of the Heuristic Evaluation.

It is not possible to present all the results obtained from analysing the usability of the screen pages proposed by CISMeF. Some of the results of the heuristic evaluation on the homepage of the CISMeF are illustrated below.

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Fig.1: screen shot of the CISMeF homepage. We divided this homepage in 8 numbered zones.

Guidance and prompting. There is no clear invitation to choose one action in preference to the other. Users' attention is drawn towards the centre of the screen (zone 6), but the search engine (zone 2 and 3) is not placed in this central area.

Grouping of items (by location or format). The banner on the left does not differentiate between information concerning the general web site of the Rouen university teaching hospital and information specific to the CISMeF.

Legibility. The legibility of the page is poor. CISMeF does not respect the guidelines or standards adopted by the majority of web sites designers (adequate police size, no italics, less than 50 characters per line of text, …).

Workload : density of information. The home page is crowded with heterogeneous information. On this page alone, there are 41 hypertext links. This overload of information makes navigation and orientation in the web site difficult.

Explicit control : user control. The user interface is lacking in navigation aids : no signposts for identifying the type of page located, no functionality for going backwards, no functionality for returning to the CISMeF home page after going to another web site via a url link.

3.2. Results of the usability test

The test of usability confirms the results of the inspection of usability. Moreover, it helps in rating the severity of the usability problems.

The test of usability also confirms the relevance of the variables identified to characterize the population of student users : the three 2nd-4th years students familiar with the Internet all succeeded in finding a target document, whereas only one out of the four 1st year students unfamiliar with the Internet could achieve the task.

Only 5 students out of the 12 succeeded in achieving the prescribed task. For example, a majority of students having identified a list of available documents were unable to reach these documents because they couldn't identify the action "clic on the url address". This problem proves very important because it significantly impairs the students' overall performance.

Considering the search behaviours, some interesting tendencies appear. The use of the search engine is efficient, but few students used it (5 out of 12) because they didn't notice it. The 1st year students and the subjects unfamiliar with the Internet used mainly the alphabetical index, while the 2nd-4th year students and those familiar with the Internet relied on a search strategy using the thematic index. The use of the thematic index proves to be efficient and rapid, but it involves some skills in both domains: knowledge of medical vocabulary and knowledge of search procedures on the Internet.

However, more subjects are needed to properly analyse and model the students' search strategies. Such a model of activity [5] would allow high-level recommendations for the re-engineering of the interface.

4. Discussion.

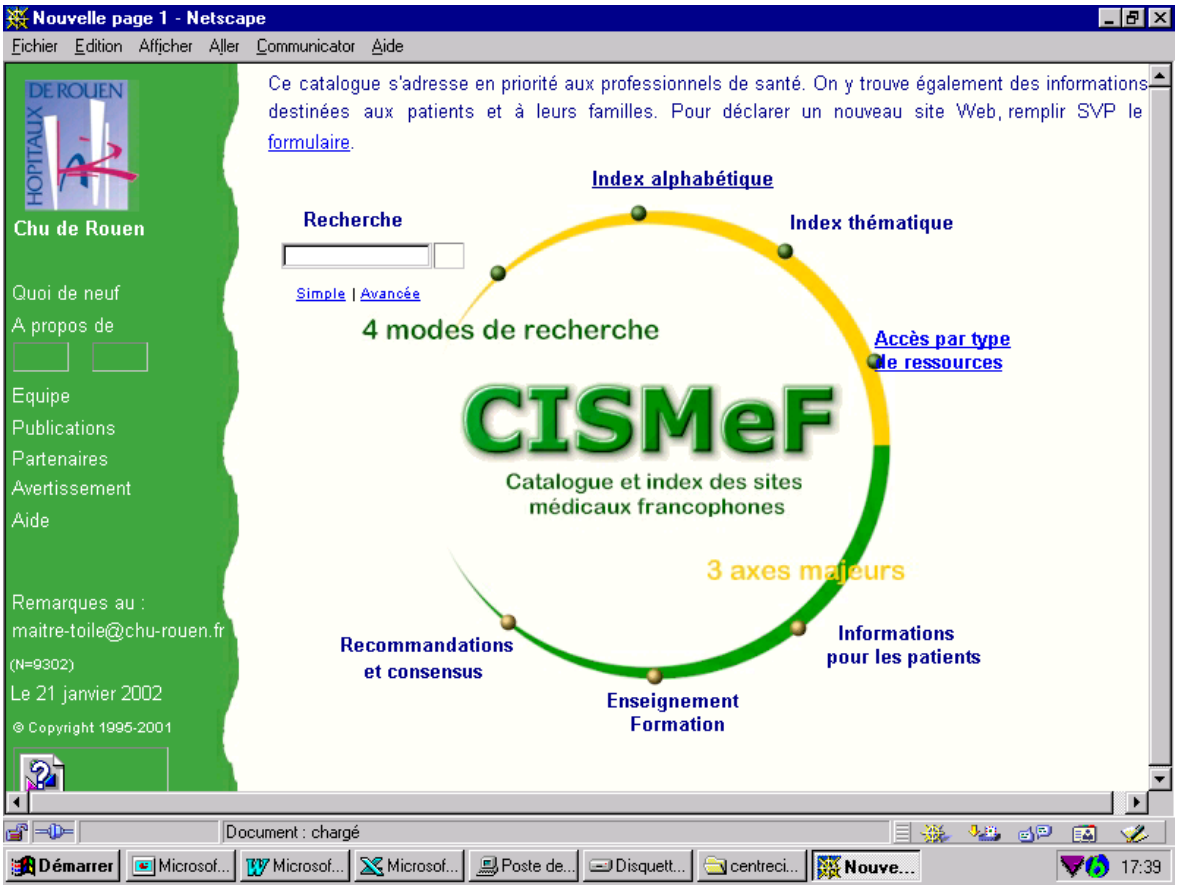
The inspection and the test of usability carried out make it possible to determine a certain number of recommendations for the improvement of the ease of learning of the site, in particular for the first-users and the subjects hardly familiarized with Internet. For the CISMeF site, the principal recommendations would be:

To refit the home page: for exemple, to dissociate the Home Pages of CISMeF and of the CHU of Rouen

To facilitate navigation and the location in the site using a navigation banner

To improve the overall legibility of the site.

Following our recommendations, the CISMeF team designed a new home page, which should be assessed for its usability in the next step of the iterative process of evaluation.



Prototype of the new home page of CISMEF

5. Conclusion.

Integration of usability engineering in a project lifecycle has extended quickly, mainly in the United States [6]. One notes however that the concern for usability is not yet very present in the Medical Informatics domain, especially in Europe. The CISMEF site is integrated into the French-speaking Virtual Medical University project, in which the usability concern was included from the onset. Most of the studies undertaken to date [7] show that the cost/benefit ratio of usability engineering is usually advantageous. We have no doubts that it will be the same for a project as ambitious and strategic as that of the UMVF.

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