
Information for the public about disease: usability issues in the development of the National Electronic Library for Communicable Diseases

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Keywords

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Abstract

The Institute of Health Sciences at City University has been funded by the Department of Health to construct a National Electronic Library for Communicable Disease to form part of the National Electronic Library for Health. As a final preparation for its launch, the developers have been conducting a number of experiments to test public understanding of the information housed and if the site is easily accessible and usable. This paper reports on the results of the usability tests, carried out in the Science Museum in February 2003. Data gathering was by questionnaire, observation and interview. Findings suggested a great appreciation of the site by members of the general public.

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Introduction and background

The National Electronic Library for Health (NeLH) was developed in response to the Department of Health report *Information for Health* in 1998. Virtual branch libraries, currently known as Specialist Libraries, were introduced in 1999 as multi-disciplinary portals covering health and healthcare topics (NeLH, 2003). City University has been selected as the preferred provider of the Communicable Disease Specialist Library within the NeLH. Educating and informing the public is considered essential to help and reduce the further development and spread of antimicrobial resistance. There is currently a wide concern about inappropriate use of antibiotics and the importance of educating the public has been highlighted by a number of influential reports (Department of Health, 1998; House of Lords, 1997). It has long been recognised that patient expectations influence their doctor's decision to prescribe antibiotics (Bauchner *et al.*, 1999; Macfarlane *et al.*, 1997). The National Electronic Library for Communicable Disease (NeLCD) has responded to this concern by developing a Web site to inform the public about antimicrobial resistance. The Web site provides an interface for the public to evidence-based information held in the NeLCD and provides summaries of the evidence related to antimicrobials, resistance and antimicrobial use in common infections. Its aim is to inform the public of current evidence-based guidelines on antimicrobial prescribing and the issues surrounding those guidelines in an effort to reduce patient pressure on doctors and subsequently reduce inappropriate prescribing.

The aims of the study

A user study was undertaken in the Science Museum, London, in February 2003 to test various aspects of the site. The aim of this part of the study reported here was to examine the "usability" of the Web site, including issues related to site structure and organisation, labelling/signposting, and the level of difficulty of the language. These elements formed part of a larger study, which examined the extent to which the participants' knowledge of communicable diseases was enhanced by their use of the Web site, reported elsewhere (Madle *et al.*, 2003).



Methodology

Three computer terminals were set up with an off-line version of the NeLCD Web site loaded. Museum visitors were approached and invited to participate in the study by looking at the NeLCD Web site and answering two online questionnaires. One was a short pre-use survey, consisting of questions on antibiotics, which was repeated at the end, in order to test the knowledge acquisition[1]. The post-questionnaire also contained statements on usability, with which participants were invited to agree or disagree, free text comment boxes and questions about age, level of education and confidence using the Web.

The questions on usability were based on Nielsen's (1994) usability heuristics and Lewis (1995) paper on using psychometrics to measure usability satisfaction. Respondents were required to consider the following statements and indicate their level of agreement on a five point Likert scale (ranging from "strongly agree" to "strongly disagree"):

- The language of the site was easy to understand.
- The look and feel of the site was consistent throughout.
- Overall, I am satisfied with the look and feel of the site.
- It was easy to know where to look for information on this Web site.
- It was easy to know where I was in the site.
- Overall, I am satisfied with the time it took to find the information on this Web site.
- Overall, I am satisfied with the support information on the Web site (e.g. site map, glossary, navigation menu, search facility).

Secondly, the questionnaire offered space at the end for free-text additional comments. These were almost exclusively used to offer thoughts on aspects of usability and/or language. Further data collection was possible through informal observation and interview. A paper feedback form was also made available.

During periods in which the researchers were not recruiting subjects (i.e. when all the terminals were in use) people undertaking the evaluation sessions were asked if a researcher could sit with them and engage in the search exercise. Here subjects were asked why they elected to open certain pages, if the information helped to answer some of the questions posed before they accessed the site, and what they thought of the content and structure of the site generally. Some respondents who were not formally interviewed in this way, chose of their own volition to talk to the researchers after they had completed the session. They were asked similar questions. Much informal non-participant observing also occurred, where the researchers strolled between the terminals, observing and making themselves available for questions or comments. These combined activities help to build a picture of the usability of the site and of general

opinions about it, which were richer and more detailed than those obtained purely by questionnaire results.

The recruitment of subjects was opportunistic, in that any member of the general public over the age of 16 was asked to participate, if they happened to be in the general vicinity of the test area. Similarly, those interviewed were the people who were using the terminals at a time when a researcher was free to engage them. Observation was also undertaken when possible, and of whomsoever was participating at the time. Whilst, it would have been almost impossible to calculate the number of people observed, it is estimated that around 30 people were observed for a period of approximately 5 min or more, around 25 engaged in informal conversation (of their own or the researchers' instigation), and eight were formally interviewed during or after they undertook the search exercise.

Findings

The Likert scale question showed a high level of satisfaction with the system, with over 70 per cent of respondents (n = 165) agreeing or strongly agreeing with all the statements. Interestingly, the highest positive score was for the statement "the language of the site was easy to understand", with which 85 per cent (277) of respondents agreed (or strongly agreed). Oral (i.e. face to face) and written comments (in the open question) elaborated on the themes, and it was possible to delve into opinions of and reactions to the site in greater depth. Some remarks about the difficulty of the language were elicited here. However, only 9 per cent (six of 67 entries) of respondents expressed any concern, perhaps reflecting a more general satisfaction, and therefore showing that the free text comments and the responses to the Likert scale question are comparable. Of those who did mention language in their free-text answers, only one person felt moved to state that the language was, in his view, "easy to understand". There was some unease amongst other respondents that the language was "slightly complex for people under 18" (supported by a 12 year old who complained that it was not easy to understand for someone of his age), "not very accessible", or "(written) from the textbook point of view ... rather than how the non-scientific person will want ... information". In fact, of those who expressed difficulty in understanding the language in their free-text responses, three were themselves under 18 years of age. The site was designed for the general public and was not aimed specifically at children, however, it was decided that a reading age of 12 was appropriate for those participating in the study. The reading level of patients and others who need health information has

long been recognised as a potential problem, with various commentators suggesting that documents should be written for a reading age calculated as between 12 (Albert and Chadwick, 1992) and 9 (Griffin and Griffin, 1996). Of course, it has also been recognised that this practice itself brings with it the problem of patients finding such literature patronising, uninteresting and lacking in authority (Kenny *et al.*, 1998).

As with the free-text questionnaire, there were some fears expressed that the language used might be too difficult for the “lay” reader. Research in use of the main NeLH Web site, of which the NeLCD is a part, carried out in public libraries showed that some people did not understand the information on the “main” site, either (Lancaster, 2003). A minority felt that there might actually be too much information (“it’s OK if you know exactly what to look for, but you could get drowned in stuff otherwise”). These are difficult problems. Lancaster felt that the issue of degrees of difficulty could be solved by indicating the intellectual level of particular pages. One of the present authors (Williams *et al.*, 2003) has suggested that the facility of the Internet to enable hierarchies of pages could be utilised to present information “vertically” rather than “horizontally”, where structure is by the topic only, and not by the level or difficulty. Presenting information “vertically” suggests that information on the same topic is layered, as Lancaster suggested, at different grades, and which one burrows down into, until the required level is found.

It is worth noting that there are problems related to oversimplification of the language, as this leads to a loss of detail. Certain medical terminology has to be included, but the provision of a glossary goes some way in simplifying and explaining the language used to ensure that the detail is not lost. In addition, getting a balance between those who want more simplified information and those who want more depth, is difficult and there will always be people at each extreme who are not happy. One comment sums up the problem: “more depth would be useful, [but] without having to read the documents [*sic*]”.

With regard to narrower issues of usability, such as those of labelling, orientation and finding information, questionnaire returns indicated that, generally there were no problems navigating around the site – slightly more than 70 per cent of respondents agreed (or strongly agreed) that it was easy to know where to look for information on the site, to know where they were on the site and that they were satisfied with the support information (site map, etc.) This was also largely true with respect to those who observed and interviewed.

Several points emerged, however. First, as has been found with other Web sites (Williams *et al.*, 2002), interviews and observation showed there were

possibly too many main menu items. This was commented on orally by some users, whilst in other cases subjects had to ask if and where the section required to find information was (pages on “earache”). The use of the acronym AOM may have caused confusion – if participants did not read the introduction carefully they may not have linked AOM to the required pages. The section was listed and visible without the need to scroll down, but was amongst so many other entries, formatted with a very small font size, which made it difficult to find. However, this could easily be changed and is probably dependant upon individual computer set-up.

Surprisingly, only two questionnaire respondents mentioned the menu entries. One suggested more submenus, and another advised the use of drop-down menus – both of which would cut down on the long list presently offered.

Secondly, there were question marks about hyperlinks. Two interviewees and a questionnaire respondent complained that there were too many, with the interviewee lamenting “this is always the problem with the Web” and suggesting that “just because the technology is there (to create such links) there is no need to make them for the sake of it”. Clearly, however, this respondent was not thinking specifically about the NeLCD site *per se*. Two questionnaire respondents reported incorrect links. One of the reasons why the site was piloted in this way was, in fact, to ensure that these bugs were spotted and corrected before the site went live. These may have been due to an error in the system in which the link to anti-bacterials opened a page on bioterrorism – mentioned by several subjects in person. In observations by the researchers, some searchers were seen to attempt to activate what they thought were hyperlinks but were, in fact, simply bold text.

An issue that has arisen earlier in usability studies by one of the present authors (Williams and Nicholas, 2001) is that of new browser windows opening. This happened on the NeLCD site, which some of those interviewed and observed found a little disconcerting. Many people do not know how to close a window, and some are confused by the “back” button being greyed out (when a new window opens, its “history” starts from the moment it appears). Previous pages are recorded by the original browser, from where one can “back-navigate”. The use of the new window facility can in some cases be a necessity, however, despite the problems. For example, there are links on the main NeLCD site that once opened do not allow the facility of clicking back to the original page – hence opening the page in a new browser window is a necessity to prevent the user becoming lost.

In addition to hyperlinks and contents (or “menu” items), site navigational aids include a search engine, site map and glossary. However, observed navigation consisted virtually solely of using the main menu and

the back button of the Web browser. The browser task bar was, inadvertently, shallow (being a side-effect of the way the browser was configured), making the buttons thinner than might be expected. Thus, the back button was not as visible as is usual.

Although this caused a small minority of searchers to ask how they could retrieve the previous page (“how do I get back?”), and prompted one questionnaire respondent to actually suggest having such a button, it did not appear to appreciably reduce heavy use of the browser for navigation.

By contrast, only two people observed were seen using the search facility, one of those only because he asked the researcher what the options were for finding the information. Although this lack of use might be in part due to the comprehensive menu list, it may well also be due to people simply not noticing these facilities. The links to the search engine, site map and glossary are located above the main NeLCD title.

This is written in large text, and somewhat detracts from the links to navigational aids above. Site developers confirmed that this was something to think about. By having the title and the size, the user is able to identify quickly what site they are on, whatever page they come in at, but the trade off is that it may detract from the links above. Also, to access the text box for search usage, one has to activate the “search” link – it is not visible on the home page itself, as it is on the NHS Direct or other health Web sites. This is, however, being planned.

Questionnaire returns tended to support the observation that these facilities were not substantially used. Only two respondents mentioned the site map (one saying simply that it “could be improved”, and the other that it “did not show where you could find more specific information”). The site map has been made more specific following these comments, with links to individual FAQs rather than just categories. The search engine itself was possibly used to a greater extent. Of the three people who mentioned it in the questionnaire, two said it did not work properly (they were correct, there is a “bug” which is currently under investigation), and the other that it sometimes “navigated to glossary” (another incorrect link now rectified).

This paper has concentrated very much on problems that the study elicited. However, it should be said that many respondents who commented generally on the content were extremely positive. One described it as “helpful” and others as “interesting” and “informative”. These views represent a more general satisfaction and show that the free-text comments and the responses to the Likert scale question are comparable. Such findings reflect comments offered to researchers during and after sessions, where much appreciation of the site was expressed. Subjects were told that the researchers had built the site themselves and seemed keen to express

their admiration. There was a general view that it was “marvellous” to have “so much information free to people” and an appreciation of the work of those who had compiled it.

Conclusion

This exercise proved very useful indeed for the development of the NeLCD Web site and, indeed, will no doubt inform the development of the main NeLH site also. Findings showed a great appreciation of the site and high levels of satisfaction with it.

Nevertheless, useful material was elicited regarding the language and the site construction and organisation. Principal points were that it might be useful to attempt to organise the site with fewer menu entries; the navigational aids need to be more prominent and care needs to be taken in confirming the functionality of the hypertext links.

The issue about new windows being activated needs to be monitored, although until there are more “back-links” on the main NeLCD site, the advantages of activating a new window appear to outweigh the disadvantages. Finally, language and language level needs to be constantly under scrutiny.

As the site grows, it may be possible to order information in tiers using “professional/lay” or “advanced/basic” labelling. In fact, this is already happening to an extent. Each FAQ and external resource is a document in a domino database and has a coverage and “Publication type” field. These are the same as the main NeLCD fields with the coverage choices being, for example: treatment; prevention, public information, economic analysis, clinical description. The “Publication type” options include: fact sheet, guideline, editorial, surveillance data, public leaflet, database and others. The plan is to enable people to search by these fields, thereby allowing them to limit their results to public information or public leaflets if they wish. This will be particularly important as the site grows and when it is linked to the main NeLCD database. Clearly, further research is needed to look into the wider area of medical terminology.

Note

- 1 The questionnaires both contained seven true/false statements about antimicrobial resistance in general, and six statements about the use of antibiotics in Acute Otitis Media (AOM) that the user was asked to rank their agreement with on a five-point Likert scale. Participants were able to freely browse the Web site, on the understanding that they would be asked the same questions again. Findings from this part of the study are available from the authors.

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