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Information-based websites

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Abstract

Traditionally, libraries were the major information source for the public. However, as society's use of the Internet has increased, traditional information suppliers such as libraries have been forced to adapt their offerings to maintain their role as a major supplier of information. In 2002, 66% of Australians and 57% of the UK population had Internet access (CyberAtlas, 2003, p. 224). As these figures increase, researchers are more inclined to expect that information be both current and accessible from their desktop. The ease and speed of publication on the Internet makes this goal achievable.

INFORMATION-

BASED WEBSITES

A USABILITY ASSESSMENT OF A LIBRARY WEBSITE

ALISON NORRIS

Traditionally, libraries were the major information source for the public. However, as society's use of the Internet has increased, traditional information suppliers such as libraries have been forced to adapt their offerings to maintain their role as a major supplier of information. In 2002, 66% of Australians and 57% of the UK population had Internet access (CyberAtlas, 2003, p. 224). As these figures increase, researchers are more inclined to expect that information be both current and accessible from their desktop. The ease and speed of publication on the Internet makes this goal achievable.

As a result, over the last ten years, libraries have increasingly provided online access to information through Websites, allowing resources to be accessed from the Internet, and away from immediate research support. As client satisfaction with Websites depends on ease of use, and this reflects on the traditional library organisation, there is a need to evaluate Website usability. Library Websites must therefore be usable by their target audience. The challenges faced by libraries in designing interfaces that can meet the broad skill range of the users are similar to those faced by all information-based Websites. To be successful, all information-based Websites must find a way to arrange their information that allows novices, highly skilled researchers, and experienced site users to find the required content. While this research is focused specifically on library Websites, many of the experiences and findings are relevant to a wide range of Websites that are based on the provision of information.

LITERATURE REVIEW AND METHODOLOGY

The purpose of this study was to conduct a usability assessment of library Websites, with results used to guide libraries in the design of Websites that meet user needs. Designers of library Websites must remember that the client base of the Website is not limited to patrons of the physical library. Users are likely to come from a range of backgrounds, with varying levels of experience.

As well as general usability issues causing difficulty for users, library-specific issues have been identified as potential problems in previous studies. Studies by Roger Williams University Library and Victoria University Library revealed that links and content arranged under subject categories were often misused or under-utilized because the clients did not necessarily class their information requirements under the headings chosen to represent them (Maquignaz, 2002), and that users were generally confused by terminology used on library Websites (McMullen, 2001). It is often difficult to determine how to logically organise content to best suit users. Jordon (1998, p. 34) recommends prioritizing the features and sections of a Website, based on their frequency of use or importance. Once this order of priority has been established, the location of content and links can be assigned, with the higher priority items being placed prominently on the homepage. Victoria University (Maquignaz, 2002) revealed that library Website usage, and specifically the content required by users, is seasonal. For example, students may use the library Website for research during early and mid-session, and to locate past exam papers late in the session. One study revealed that clients expect library Websites to act as a "doorway to the Internet" (McMullen, 2001), providing a niche that library Websites have the potential to fill if they are usable.

When designing the testing methodology, it was necessary to consider assessment of issues relating to locating information, understanding information, the provision of facilities to support user tasks, and the presentation of information (Payette, 1998, p. 122; Raward, 2001, p. 123).This study collected data about the usability of Australian university Websites through overt observation and questionnaires. A questionnaire was used to record demographic data, which was later correlated with the test script results and the post-test questionnaire feedback to assess the varying needs of different client groups.

The test script comprised seven information-finding tasks. All were simple questions, with no comparisons required. The purpose of the tasks was to record the navigation decisions made by users when locating information, and to observe the level of difficulty experienced by each participant in find-

ing that information. All tasks were attempted on the University of Wollongong (UOW) Library Website. Participants were observed during this process, with usability experts such as Nielsen suggesting that the most accurate way to identify problems is to directly observe users, because user claims and user behaviour are often contradictory (McMullen, 2001; Payette, 1998, p. 124; "Survey: design Darwinism," 2001).

Nielsen claims that testing with more than five users is only necessary when the Website has several highly distinct user groups. In such cases, three or four users from each distinct group should be tested (Nielsen, 2000). Campbell's studies have suggested that feedback from eight people will reveal 80% of the total usability problems (Campbell, Walbridge, Chisman, & Diller, 1999, p. 307). Twenty-five participants were used for this study, to ensure adequate representation was recorded for each user group. The participants were from a range of faculties, and included undergraduates, postgraduates, and academic and general staff. All were affiliated with the University of Wollongong, which was the Library Website used to conduct the usability tests.

Once all tasks had been completed, participants were given the opportunity to access two other Australian university library Websites prior to providing feedback on the UOW Library Website. Participants then completed a feedback questionnaire, with the data collected used to assess the usability of the UOW Library Website from the user perspective. Questions required participants to rate specific aspects of each of the three sites using a Likert-scale response (1–5 scale). The areas of interest included navigation, terminology, research facilities and services, content organisation and general Website design preferences.

Participant comments made during the testing were recorded, and were later compared with the responses recorded in the post-test questionnaire. Together, the time taken, comments and navigation path were used to build a picture of each participant's understanding and use of the site. All participants completed the information-finding tasks on the UOW Library Website [http://www.library.uow.edu.au].

RESULTS AND DISCUSSION

The average task completion rate was 77%, which was identical to the 77% task completion rate for first-year clients. This result indicated that experience did not play a large role in the ability of the client to locate information. A study by Gullikson also found that there was no correlation between prior experience using a Website and participants' perceptions of that Website (Gullikson et al., 1999, p. 298). An assessment of the Internet search engine Alta-Vista also discovered no significant correlation between experience and

task completion rates (Ford, Miller, & Moss, 2003). The completion rate indicates that usability of the Library Website could be improved. All participants recorded using a computer at least a few times a week, and the Internet at least once a week, suggesting that the problems associated with using UOW Library's Website were therefore not due to inexperience.

UOW Library Website usage was varied amongst the surveyed clientele. There was no correlation between frequency of Website use, and participant perceptions and ability to complete the specified tasks (cf Figure 1). Discussions with participants revealed that clients who used the Website more than once a week commonly did so because they conducted inefficient searches, and were often unable to find the required information during their first attempt. Participants who used the Website weekly scored the highest on the tasks, and appeared to be the most efficient and confident users.

Previous studies have shown that, rather than experience using the Website, knowledge in the specific subject domain is the major factor in a user's ability to design more efficient, focused and successful searches, and with this knowledge, users were better equipped to understand the search results. This success was attributed to the use of more appropriate and technical terminology in the searches (Thong, Hong, & Tam, 2002, p. 224). The impact of knowledge in the subject domain may also have been a factor in the higher success rate of staff (90% of tasks completed successfully) compared to undergraduate and postgraduate students (74% and 59% respectively).

While some of the issues identified by participants were Web usability problems, other problems were due to a lack of understanding of library terminology, facilities and processes. Terminology refers to 'the words, sentences, and abbreviations used by a system' (Lingaard, 1994 cited in Thong et al., 2002, p. 219). Many studies on similar Websites have determined that there are often discrepancies between the informal terminology used by users to express their information needs, and the technical terminology employed by libraries to describe the resources provided (Thong et al., 2002, p. 220). .

Participants recognised that some jargon was appropriate and unavoidable, however their behaviour indicated that much of the terminology was poorly understood. Approximately 30% of participants did not understand the term 'Catalogue.' Participants suggested that misunderstandings related to technology could be overcome by using concrete terms and task-based guidance. Less-experienced users preferred information organised in task-based divisions that represent user-centric activities, while experienced users requested clear links to all major research services from the homepage. Duplication is required to support both user groups. The University of Washington's study investigating the impact of terminology on usability concluded that grouping resources together under concrete, descriptive names allowed users to make more efficient navigation choices (Veldof & Mills, 1999, p. 128).
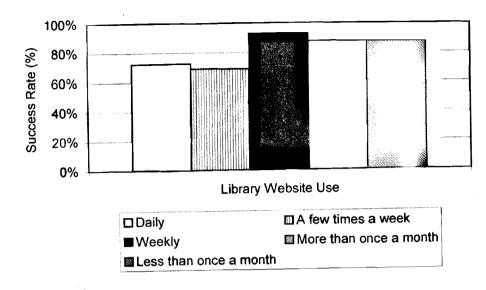
Figure 1: Library Website Use and Task Completion Success Rate

As the gateway to any Website, the homepage must be well-designed. Participants experienced varying problems with the homepages of all three library Websites. A vertical arrangement of links was preferred, as they believed it was easier to read and faster to scan. Two divisions of links were considered: task-based (e.g. 'Finding Information,' 'Borrowing') and client group (e.g. 'Resources for Postgraduate Students,' 'Resources for Undergraduate Students'). Almost all participants indicated that they would prefer to have both methods of organisation available on a site, with their usage depending on the specific query.

Another project that undertook the task of arranging online information resources to meet varied needs was the *Tasmania Online* project. After much investigation, the project incorporated alphabetical listings, subject navigation hierarchies, free-text searching and special content groupings. This allowed clients to search by subject category, task-oriented option (e.g. make a payment) or customer-oriented categories (e.g. the aged) (Sokvitne, 2002, p. 170). These options were cross-referenced, so that users were able to navigate in the manner most logical to them. Whatever design is chosen, the homepage should represent user-centric activities, rather than a categorical organisation of information resources (Payette, 1998, p. 127). Participants stated that the information they required most often on the UOW Library Website was located through the Catalogue and Databases, with Circulation Record details also accessed regularly by users. These results were

supported by Website access statistics published by UOW Library (University of Wollongong Library, 2003, pp. 4–5). Feedback indicated that these items should feature prominently on the Library homepage. Participants employed different methods of locating information depending on whether they were completing a topic search, or locating a specific book or article. Therefore, guiding clients by the type of search required is an ideal solution.

The area with the greatest potential for improvement is navigation labelling. Labelling problems on the UOW Library site were largely related to the use of library-specific terminology without an explanation, and the use of terms such as 'Eresources' and 'Ereference,' which clients do not thoroughly understand. Inconsistent terminology was also identified. Lack of consistency in some of the sites in areas such as layout, navigation and colour scheme was also noted by participants.

Participants believed that the Catalogue should act as a single point of access to all research resources available from the library, including books, journals and electronic databases. The ability to limit the search to specific types of resources, as well as search all simultaneously, is ideal. In a study by Spink et al. (1999) conducted using the EXCITE search engine, it was revealed that the use of a meta-search tool is more effective for users than using a single Web search engine. This result is similar to feedback from participants in this library Website study, suggesting that user desire to have one single point of search is relevant in many areas across the Internet.

Options for the Catalogue search types (e.g. author, title, keyword) should be clearly labelled, with brief explanations of input format (e.g. Boolean, author name format) provided. Links to other libraries were seen as valuable, however should be kept completely separate to the local Catalogue. This finding is relevant to all information-based Websites, as it demonstrates the need to clearly separate information on the current site from links to information on external sources. The search history feature provided by some of the library catalogues was popular, and is also likely to be valuable on general information-based Websites. Formatting of results was an area of concern for some participants. It is essential to label all results fields and delineate each record. Providing key details of each result, one line per record, on the initial results page was preferred to allow users to scan results quickly.

When users are attempting to select an electronic database to use, users are commonly provided with a list of databases by general research area, such as 'commerce' and 'computing.' Organising databases by narrow subject divisions, such as 'accounting,' was preferred by participants, along with an alphabetical listing of all databases available. The ability to search multiple databases simultaneously was also requested.

While it could be argued that users of library Websites are likely to develop their skills over many visits, and are also likely to be well-educated, this does not indicate that library Websites should be more complex to use

than general information-based Websites. All basic features should be self-explanatory, with studies showing that novice users rarely read instructions or tips (Veldof et al., 1999, p. 128). Previous research has determined that background knowledge allows users to design more effective searches (Thong et al., 2002, p. 224), suggesting that experienced researchers will be able to use basic search features more successfully than inexperienced users. However, it is appropriate for library Websites to be designed to suit the needs of academic researchers (Jordon, 1998, pp. 39 & 41), and therefore include more powerful functions. Where complex search features were provided, participants appreciated links to relevant guides at the point of need. One library Website that was reviewed contained a large Help section, including numerous screen shots. Many participants were overwhelmed by this excess of information, and stated that the process should not be so difficult that it required so much instruction. Participants felt that too much content was a hindrance to finding information. This was especially true when the amount of content resulted in an excessively deep navigational structure.

According to research, users are 50% more likely to find the desired information if they browse rather than use a search engine (Radosevich, 1997). Designers of Web-based Information Systems for organisations have found that it is necessary to facilitate effective exploring and browsing and display multiple viewpoints for users, as well as providing an effective information search mechanism (Detlor, 2003). Despite the fact that search engines are rarely effective, and many users do not know how to use them efficiently, most users still complain if there is not one present (Radosevich, 1997). During testing, over 70% of participants used UOW Library's search facility at least once. However, as demonstrated by numerous participants, a study using the EXCITE search engine demonstrated that users were unaware of the benefits provided by the different types of searches available (e.g. basic/advanced) due to a lack of transparency (Spink et al., 1999). The use of the search engine was the default response when participants were unsure where to locate the required information. This indicates that the search facility should be easy to find on the site.

It is essential to realise that there is not a generic user being served by each library Website. While it is important to provide a general design that meets client needs and supports generic behaviour patterns, each user is different and it is unlikely that all users will follow the planned path for every activity. This was demonstrated during the test script tasks. It is therefore necessary to have flexibility built in to the navigation structure, and to recognise that there are several logical paths to access the same information (Payette, 1998, p. 127; Radosevich, 1997).

As well as the problems with terminology, other issues raised by participants included the need for intuitive search facilities, and a general Website design that placed only essential research links on the homepage.

RECOMMENDATIONS

Client perceptions and feedback have been amalgamated to develop recommendations for the design of university library Websites. Prior to implementation of any recommendations, it is essential to complete a background study to determine the goals of the Website. The priority of university library Websites is to provide information about, and where possible access to, library resources and facilities. Many of the recommendation are also adaptable to general information-based Websites.

HOMEPAGE DESIGN

The homepage should:

- Provide user-centric, task-based links for inexperienced users
  e.g. 'Search for a book,' 'Search for past exams'
- Provide direct links to all research services for experienced users
  e.g. 'Catalogue,' 'Databases'
- Organise links into task-based groupings and by client groups
- Use short, descriptive and concrete link titles
  e.g. 'electronic resources' instead of 'e-resources'
- Contain featured links at appropriate times of the year
  e.g. 'Past Exam Papers'

Navigation and Information Organisation

All pages on the site should:

- Contain direct links to popular pages (e.g. Home, Catalogue, Databases)

All pages other than the homepage should:

- Be information-based rather than navigation-based where possible

Search

- Provide a visible search engine, and ensure users are aware of the coverage of the search engine; e.g. 'This searches only the Catalogue,'

'This searches all print resources,' 'This search covers all content on the Library site'
- Provide a spell-check feature, or display a 'Check your spelling' messages when no exact match is found

Terminology

To minimise confusion and reduce usability problems caused by terminology:

- Refer to a task as well as a method; e.g. use 'search for a book' as well as 'Catalogue'

- Provide alternative paths to reach popular items, to cater for varying abilities, levels of understanding and research methods

External Resources

To help users more efficiently use external resources (including databases):

- Provide a list and brief description of external information sources (such as databases) accessible via the site; e.g. Lexis database: newspapers; APAFT database: Australian resources
- Where possible, allow users to search multiple databases simultaneously through third-party software
- Investigate platforms such as MetaLib, which allow simultaneous searching across a range of databases, including the Catalogue where possible

Help Facilities

- Where necessary, brief instructions should be provided on how to locate relevant print and electronic items
- In situations where more complex instructions may be required by the user, a link to the detailed instructions should be provided. These instructions should not be displayed to users unless they request them.

CONCLUSION

This research involved only one round of usability testing. After application of the recommendations to the UOW Library Website, it would be ideal to reassess the usability of the Website to determine whether the recommendations presented have contributed to the design of a more usable site. Additionally, because of the nature of this study, and the ever-changing requirements of the Internet and clients, it would be appropriate for this study to be repeated in 12–18 months time to assess the success of any implemented changes on university Websites, identify any further changes required, and determine whether the usability recommendations remain applicable. Through further rounds of testing, these recommendations could be further refined to create a university library Website usability assessment framework that thoroughly assesses both general usability issues and library-specific requirements.

Participants completed an average of 77% of the specified information-finding tasks. As with previous studies, there was no clear relationship between experience with the Website and user success, with success more closely linked to domain knowledge. User feedback indicates that links to services and content on information-based Websites should be provided in two formats: task-based user-centric links to support inexperienced users, and direct links to research services for more experienced users. One efficient way of organising the links is by client group. Duplication is required to support both user groups. Library-specific terminology should be minimised, with links logically arranged in vertical lists to increase the ease and speed of scanning. Facilities should be simplified to require the fewest possible steps, with context-sensitive help available in appropriate situations. An efficient and simple search facility is also essential for all information-based Websites.

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