

# Usability Evaluation of Library Online Catalogues

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## Abstract

We performed a usability evaluation of four New Zealand university online library catalogues. The evaluation found severe usability problems with online catalogues—we found so many problems we were forced to use a card sorting technique to understand and classify the problems. These problems cover almost all aspects of catalogue use and existed across all the evaluated catalogues.

This paper describes the evaluation and a summary of the results. Additionally, we illustrate a redesigned search screen to avoid many of the problems we identified.

**Keywords:** Usability evaluation, library catalogues, card sorting.

## 1 Introduction

Library catalogues are a traditional aspect of libraries and have evolved from book catalogues to the current online library catalogue. The online catalogue is a first point of reference library users can explore to investigate what they can expect to find in the library. Users are able to search online catalogues using a wide variety of parameters that range from known details such as title or author, to more general subject searches. They can search media types other than the traditional book such as videos, DVDs, periodicals, newspapers, and even electronic resources such as online journals. They can search from within the library or at their own leisure anytime via the world wide web. A sample interface is in Figure 1.

Unfortunately, many users have trouble using online catalogues (Klein 2003). Now that computers and computer interfaces are no longer new, these problems can not be attributed to lack of technical knowledge; the problems are more likely user-interface or user-interaction issues. Being able to successfully search an online catalogue is very important because if people can not find the item they are looking for, they will not visit the library.

We performed a usability evaluation of four online catalogues. Users performed a set series of search tasks covering main catalogue functions. We choose these tasks to represent typical user interactions with a catalogue. This paper reports an analysis of the usability evaluation, focusing on identifying usability problems. We also present a sample redesign of the search screen.

## 2 Our Evaluation

We performed a usability evaluation of online library catalogues (Nielsen 1993). We chose this method of measur-

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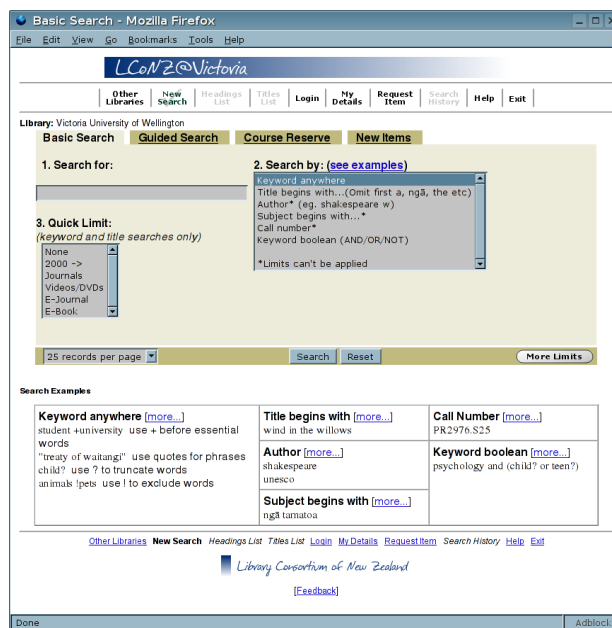


Figure 1: Catalogue search screen for Victoria University at Wellington, <http://victoria.lconz.ac.nz/>.

ing usability because the online library catalogues have already been implemented and have documented problems (for example, see Fayen (1983) or Sumner & Dawe (2001)). Therefore it seemed sensible to observe users and determine where the major interface interaction issues were occurring. We did not perform a heuristic evaluation because we wanted solid evidence of usability problems.

To avoid finding usability problems specific to one library catalogue, we evaluated four library catalogues. All catalogues were from New Zealand universities. We choose university library catalogues because our participant group was university students. Keeping the catalogues tested domain specific to the participants ensured they were able to understand the environment and context of the types of materials, subjects and resources available within the library. The library catalogues we chose (in alphabetical order) were: Canterbury University, Lincoln University, Massey University, and The University of Auckland.

The online library catalogues used for this evaluation were selected to best provide a comparison between the different catalogue interfaces available. Two catalogues that use the same software as the Library Consortium of New Zealand (LCONZ) were chosen to compare usability issues within the same type of interface (they both use Voyager). The other two catalogues were chosen as contrasting catalogue interfaces. In the remainder of this paper we refer to the catalogues as catalogues one, two, three, and four. The ordering of the numbers relates in no way to the alphabetical ordering above or to the ordering

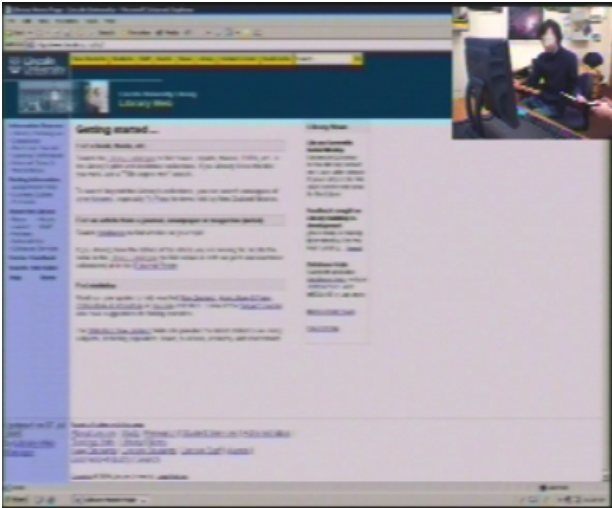


Figure 2: Participant performing an evaluation. The participant's face has been blurred to preserve anonymity. We took the screen capture using a video splitter device. We combined the video feed in real time using a digital video mixer.

in Table 1.

## 2.1 Evaluation Details

We videotaped twelve people, each of whom answered a set series of eight questions. We used a between-subjects design and assigned three participants to each catalogue. Each participant was given a standard welcome and introduction and was asked to perform eight tasks. The experimental design is shown in Table 1. The catalogues were rotated during the evaluations to mitigate any differences between earlier and later evaluations.

1. What is the call number and where in the library would you find the book 'The unauthorised version : a cartoon history of New Zealand'?
2. What is the title of a video on the topic of the Treaty of Waitangi?
3. Does the library hold a copy of the Dairyfarming annual from 1950?
4. Give the title and author(s) for two books containing New Zealand legends.
5. How many online New Zealand Law periodicals does the library have access to?
6. Does the library hold any copies of 'Making the Connections: using internal communication to turn strategy into action', by Bill Quirke?
7. What books are on closed reserve for the course *CRSE101*?
8. Name the most recent book held by the library by the author Patricia Grace.

## 2.2 Recording the Evaluation

We used a video splitter to acquire a live screen capture of the library interface. This video feed was combined with a video feed of the participant in real time using a digital video mixer. A snapshot of the combined video feed is in Figure 2. To ensure the best possible viability for reviewing the footage, the font size on the browser was set to large. This did not seem to alter the view-ability of the catalogues. All participants performed the evaluation using Microsoft Internet Explorer v6. Participants were asked to think aloud (Jørgensen 1989).

## 3 Discussion

While most participants answered most questions successfully (a notable exception is question 5, see Table 2), we

found that participants' experience was often hindered by the interface. An examination of the videotape found 98 distinct usability problems. Many of the initial usability issues were due to poor layout and inconsistency between screens. As a result, navigation through the interface was difficult and time consuming. The perception that training users in a particular catalogue to help them to use library catalogues in general does not always work. We found that participants who evaluated the Voyager catalogues often commented that the catalogue they had used for the evaluation was hard to use, whereas they believed the Victoria University library catalogue was easy to use. These participants failed to notice that the Victoria University catalogue also uses Voyager — the catalogues look, feel, and act in similar ways as they share a common code-base.

As we discovered 98 usability problems, we used a card sorting technique to categorise our findings (Nielsen & Sano 1994). Each usability issue was written on a card (about 2×3 inches) with the name of the catalogue which the participant was referring to on the reverse of the card. We sorted the cards into piles of related issues and from there we were able to readily determine which issues ranged across catalogues and which issues were specific to only one or two of the catalogues. This procedure classified the problems into six categories: **layout** (35 cards), **ease of use** (20 cards), **functionality** (17 cards), **terminology** (16 cards), **feedback** (6 cards), and **help** (4 cards).

The remainder of this section uses a case study of one particularly problematic feature to discuss the issues associated with each of these categories. The feature is limiting the search: a feature where users can tell the catalogue to search only particular types of item. The types of limits users can apply typically range from the language an item is written in to the date and place of publication. The feature was extremely poorly designed across all catalogues. Participants generally had major difficulty limiting a search.

**Layout:** Across all catalogues participants commented that the information output for a particular record contained too much information. This information cluttered the screen and made it difficult to efficiently sort through to find what participants were looking for. They also commented that the bold information was not always relevant to their search, therefore attracting them to information they were not interested in. Participants sometimes spent a longer period of time actually looking through the details of the record to find the information they required (such as the call number or location) than they did finding the actual record. Important functions such as sorting the results were often overlooked due to their location on the screen, and should have been placed more strategically in regards to where the users were expecting the functions. Existing, helpful, features were often left untouched due to their placement away from a user's focus.

In the limiting the search case, the limits function was often located through a button at the bottom of the page and further away from the other search widgets than the search button. As the search button should be the last widget users should use when submitting a search, the limits function is not located logically. Additionally, the attributes to limit a search are displayed in lists with only three items viewable. The most shocking display of poorly appropriated option list is the 'Language' option list which contains 372 different languages.

**Ease of Use:** The lack of consistency throughout catalogues caused confusion and caused participants to be inhibited and not as open to exploring when searching. Once a participant had found a search that seemed to provide them with satisfying search results they tended to stick to this type of search until it failed them. This approach is common with novice users of any systems. Participants also refrained from navigating their way through the catalogue with the catalogue facilities and often opted for the 'Back' button on the browser. Participants tried to transfer

Catalogue	Voyager 1	Voyager 2	non-LCONZ 1	non-LCONZ 2
Participants	1–3	4–6	7–9	10–12

Table 1: Experimental design: each of our twelve participants were assigned one catalogue and were videotaped performing eight tasks. In this paper we refer to the catalogues as catalogues one, two, three, and four. The ordering of the numbers does not relate to the ordering of this table. The Voyager catalogues use the same software as our university but have a different deployment.

searching knowledge from previous experience with on-line library catalogues or web search engines. They found that not as much as they thought could be transferred and what could be transferred was not useful. This was often due to the different search types across the catalogues and the extra options available to users when using a catalogue compared to a web search engine.

Participants did not have trouble understanding limits: they were aiming to use this function to place restrictions upon the general search. The main issues that arose when using this function was that participants had trouble selecting limits, removing limits, and viewing the current limits. Most of the limit search functions made use of multiple frames where the content was too large to fit in the size of the frame. This caused the most problems when participants were selecting multiple items from a list as they were unable to view all selections at the same time. This lead to further problems when participants did not realise they had set previous limits, which were still in place.

**Functionality:** A common issue raised by most participants was the ordering of the author search. Many wanted to be able to type the author details in any order and have it return all possible matches. Another prominent issue was to extend the limitations of the ‘quick limits’: participants wanted to have the ‘quick limits’ work across all types of searches. The participants who did not notice that quick limits could not be applied across all search types often tried to apply them for ‘subject keyword’ searches and were confused when the search did not work.

**Terminology:** Online library catalogues are loaded with specific library terminology which changes between catalogues: ‘Advanced Search’ in Catalogue 1 looks exactly the same and performs the same functions as the ‘Guided Keyword Search’ in Catalogue 3 and was called ‘Refined Search’ in a third catalogue. These terms imply different types of search. Most participants did not understand the difference between ‘Keyword Relevance’ and ‘Keyword Boolean’ searches, so perhaps both options are not required. Other search terminology which participants had difficulties understanding were ‘Subject Keyword’, ‘Subject Global’, and ‘Course Search’. ‘Subject Keyword’ was problematic as it can be misinterpreted as a university ‘Subject’ or course keyword rather than a library heading subject keyword.

Participants did not know the difference between journals, periodicals, or serials and tended to run the terms together into one group of publications which appear on a regular basis. This was a common assumption and participants who were unsure as to which category ‘Dairyfarming annual’ would come under normally chose to use a basic title search where possible or a subject search with a media type limit.

When setting limits, participants found the terminology generally satisfactory until they came upon a limit they thought they had already set. An example of this is in Catalogue 3 which had the limit for ‘Medium’ followed by the limit for ‘Item type’. Participants were unable to distinguish between the two and, at this point, displayed the urge to give up on the ‘Set Limits’ function.

**Feedback:** Online library catalogues gave limited or no feedback.

After setting limits, the user is directed to a screen to continue their search. We found that participants, at this stage, were unsure as to whether the limits had been set and were not able to see what the limits were. Although the catalogues did display a small note at the top of the screen to

question	1	2	3	4	5	6	7	8
catalogue 1	1	0	1	3	0	2	1	2
catalogue 2	3	2	1	2	0	3	3	1
catalogue 3	3	3	0	3	0	3	3	2
catalogue 4	3	3	1	3	0	3	2	3
total	10	8	3	11	0	11	9	8

Table 2: Number of correct answers for each question broken down by catalogue.

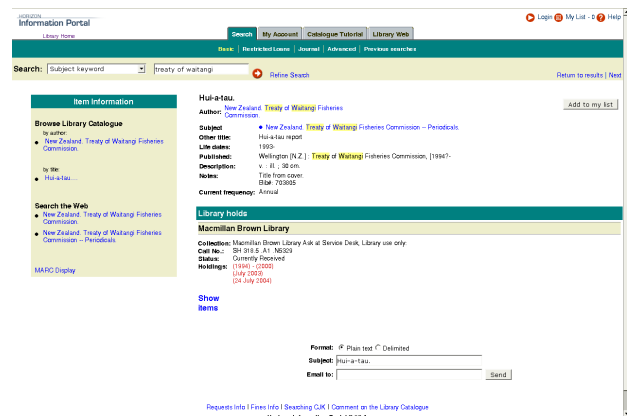


Figure 3: One of the catalogues has links to Internet searches within the catalogue.

say that limits were in place, the participants often missed the small note as the small note was outside the boxed area that held all the searching related information and selections. When starting a new search participants often missed the note telling them that the limits were still in effect, thus causing more confusion during subsequent searches.

**Help:** Participants who read the help or hints sections found they were not actually helpful to what they were looking for. One participant went as far as stating that they would approach a person before looking at any on-line help. For this reason online library catalogues need to be easy to understand and if not possible to avoid provide limited ‘help’ in the form of search examples and ‘tool tips’. Participants who used Catalogue 2 read and copied the examples formats provided for each search, and participants who used other catalogues which did not have these examples commented that they would like to see some. In the case of limiting the search, there seemed to be no help available which provided the participants with any guidance as to how the limiting search option worked. Participants were often puzzled as to what particular sections of the limit search screen meant and the interface provided no indication of where they could go to obtain help.

#### 4 Recommendations

From the results of this study we concluded that if online library catalogues had been designed following general usability principles, the majority of problems would not exist. Layout, flow terminology and help issues would have been identified early in the development process and online library catalogues would have been more usable. Based on the problems found through the user testing and

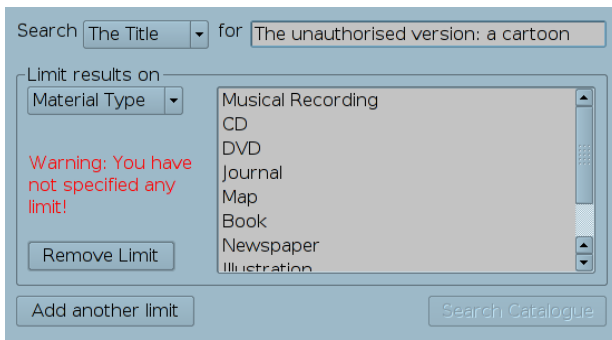


Figure 4: A mockup interface for searching online catalogues. This search interface lets the user add and remove limits to their search as required. If a multiple-select widget is not suitable for a particular limit, a more appropriate widget is substituted into the interface.

end of testing discussions, we make the following key recommendations:

**Simplify the interface.** Users of catalogues, especially casual users, do not want to spend much time figuring out what they need to do for the catalogue to provide them with a list of results. Users want to find material that fits the criteria they have. These criteria needs to be passed to the catalogue through the interface and it is important that users are able to enter the information in the right places because they understand the interface, rather than making intelligent guesses. If users understand which input does what they will be able to enter the information more accurately, thus increasing their chances of finding the material they want.

**Generalise terminology.** Casual users of online library catalogues are not library experts. They are not familiar with the terminology currently used within the catalogues. Differentiation between catalogues and even within catalogues provide much confusion and words such as journal, serial and periodical are used interchangeably. If a person searching for the availability of the 'Dairyfarming annual' cannot decide if an annual is a journal, serial or periodical they will use a general 'title' search, thus covering all the possible options. Why separate these terms and use them interchangeable within catalogue interfaces when they are just going to confuse people? There needs to be a set of defined terms which fit the terminology used outside the library world. These terms should be used across all catalogues to mitigate confusion when transferring knowledge between catalogues as well.

**Modernise.** With the prominence of the Internet when searching for information in today's society further resources from the Internet should be incorporated into online library catalogues. One catalogue from this study made an attempt at this, with a side menu which has links to web searches (these are only to Google searches — see Figure 3). It would be better if the web links were to authors home pages, for example, or to existing pages on the specified topic. The major challenge in providing this information is not in finding the information, but is in finding a good balance between providing enough information and cluttering the screen: often less is more. While online library catalogues need to provide more service than just locating information within the library, they need to avoid becoming even less usable.

#### 4.1 Redesign

As discussed in section 3, limiting the search was a feature of online library catalogues that participants found difficult to use. From a usability perspective, the main problems with this feature are hidden information, infor-

mation clutter, and complexity of navigation. These problems span the layout, ease of use, and feedback categories.

We believe that the "set limits" screens can be combined with the main search screen in a way that gives control to a user without overloading a user with the many types of limits available. Using AJAX technologies (Garrett 2005), users could have a button to add a limit. This button will dynamically change the webpage and insert a new area to specify exactly one limit. Extra limits are added using the "add limit" button again and individual limits can be removed by pressing a "remove" button. Using this interface it is easy for the user to see what limits are in place and to add and remove limits. When using this interface the user is left in control of the search and the application of limits. A snapshot of a mockup interface is shown in Figure 4.

## 5 Conclusion

This paper presented a usability study of four online library catalogues. After running the study, we found that library catalogues contain many usability problems, and proposed a new interface to help people search catalogues.

In future research we plan to implement and evaluate the redesigned search screen. Additionally, we could repeat this study using other types of library resources such as e-journals and databases which have, in most likelihood, bypassed usability testing. Alternatively other types of libraries and user groups could be evaluated such as public libraries being used by general patrons.

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