AquaBrowser and InfoLinQ: Preferences and Usability

Michael Beasley and Moises Curiel
University of Michigan School of Information
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Executive Summary

This report describes the results of a usability test conducted during the week of February 28th, 2005 at the Queens Borough Public Library Central Library. We tested the new AquaBrowser search engine against the library's current OPAC, InfoLinQ, in order to uncover user preferences.

Our major findings in terms of preferences are:

- Overall, the five users that we tested with preferred AquaBrowser for some or all tasks, and performed better on AquaBrowser with most tasks in terms of speed and/or quality of their results.
- All five of the users formulated queries that InfoLinQ could not easily handle (failure to omit a preceding article and not placing the last name of an author first). AquaBrowser was better able to handle these queries.
- The five users did not incorporate AquaBrowser's visualization, the "word cloud," in their search. We surmise that preference for AquaBrowser during our tests was based primarily on the search engine in AquaBrowser and by the appearance of the system.

The Findings section of this report goes into greater detail and describes our usability findings.

This set of tests is obviously not comprehensive and there are obvious opportunities for more studies of user preferences and usability. It is our hope that this report will serve as a useful foundation for future testing.

Introduction

AquaBrowser Library, from The Library Corporation (TLC), is a library catalog search tool. It is an information retrieval system, like an Online Public Access Catalog (OPAC), but with some distinct features. AquaBrowser tries to be more flexible in terms of entering search queries and has an innovating manner of presenting the resultant information. There are three major components to the AquaBrowser application which are advertised by TLC as *searching*, *discovering* and *refining*.

Searching consists of a single text box where the query is entered and the middle section of the screen where the results are shown, ranked by relevance (see **Figure 1**). The discover part of AquaBrowser is the left pane of the screen showing a "word cloud." The "word cloud" shows the most relevant associations, translations, spelling variations, and synonyms of the search terms entered. The refining part allows the users to filter their search queries with the options on the right side of the screen to find the most appropriate information. In this section one can refine the search by limiting the format of the material, the language, year of publication, and others.

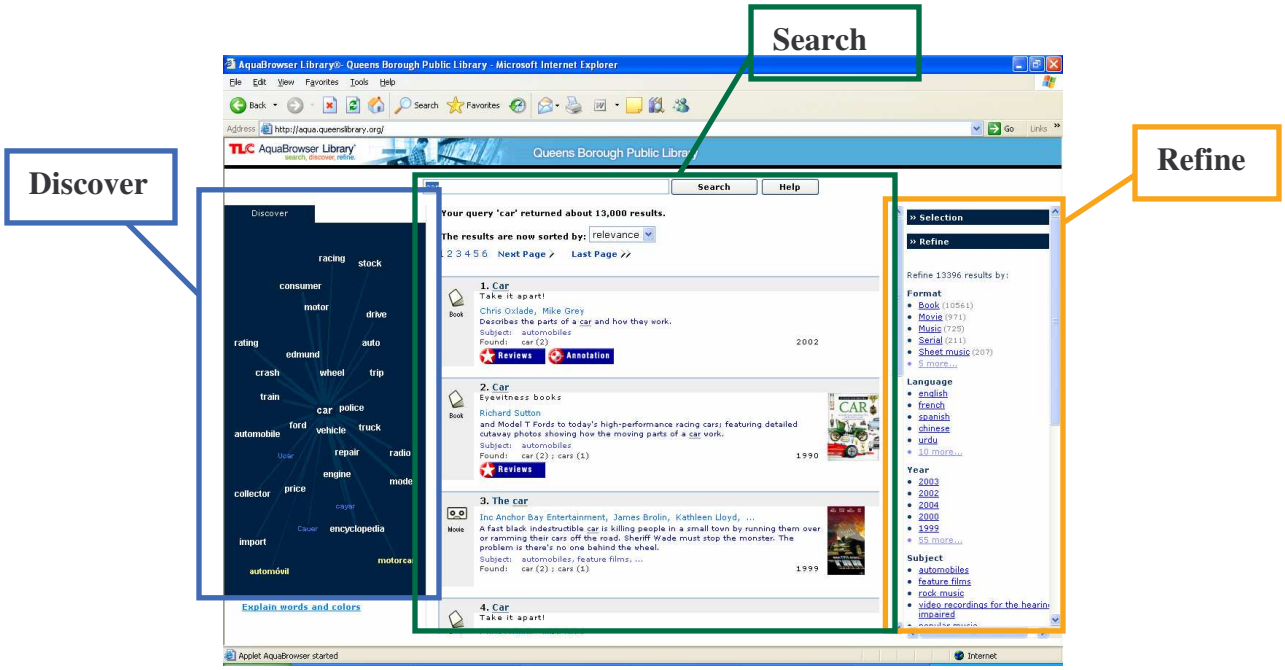

Figure 1 The AquaBrowser interface, showing its three major features.

As the Queens Borough Public Library (QBPL) is trying to complement its current OPAC, it is looking into AquaBrowser to explore with some of the modern human-computer interaction technologies that are currently under exploited.

The goal of this small study is to assess the preferences of library customers between the current OPAC and AquaBrowser, as well as to get a general feel of customer's attitudes of AquaBrowser.

Methodology

In order to assess user preferences, we decided to perform a usability test involving the two systems. The best way to determine which of the two systems users would prefer is to have them use both systems, and then discuss their impressions while they are fresh in the users' minds. Usability tests involve recruiting users from the library's customer population and having them perform a set of tasks using the two products. In this way, users are able to see how both systems work. Moreover, there is often a gap between what users say about their use of a product and their actual use of a product. Post-interviews would give us the chance to learn what users thought about AquaBrowser and InfoLinQ, but the actual tasks would give us the opportunity to observe users in the act, and see their spontaneous reactions and how easily they could actually use the two products.

When we began to devise our tests, we attempted to form an exhaustive list of the types of tasks that one would engage in on a Web OPAC. We found research on the types of questions asked at a library's reference desk[1]. Nordlie recorded 170 interactions at a reference desk over 5 days and classified them into 6 categories:

- "Help to find particular titles
- Help to find books by particular authors
- Concrete problems/directional inquiries
- Help to reserve books
- Topical (subject) inquiries
- Incomplete or technically faulty recording"

Further, he found that the topical inquiries fell into two categories: Specific factual information and general topic information. From this article, we determined that the four types of searches we should focus on were:

- Known item by title
- Known item by author
- Specific fact
- General information

The tasks that we devised are:

1. You are interested in reading the book *The Secret Life of Bees*. Does the library have a copy?
2. You are now interested in finding a book of poems about the civil war. Are there any at the library?
3. You are interested in finding a couple of books at the library about the civil war. Find two books that you think will help you find general information about this subject.
4. A friend told you that Kevin Hillstrom wrote a good book about the civil war. Does the library have a copy?
5. Are there any documentary movies about the civil war in the library's catalog?

It is important to note that none of these tasks explicitly require the use of the "word cloud." During the planning phase of our testing, we were unable to devise tasks using the "word cloud" that were both natural and would fit into a modest amount of time. We also worried about introducing a bias into the testing through the use of questions that favored one system over another. Unfortunately, we could not further refine the questions, but are confident in the tasks that we did use.

[1] Nordlie, Ragnar (1996). Unmediated and Mediated Information Searching in the Public Library. ASIS 1996 Annual Conference Proceedings. October 19-24. Viewed on 3/2/2005. http://www.asis.org/annual-96/ElectronicProceedings/nordlie.html.

We performed our user tests at the Queens Borough Public Library's Central Library on Wednesday and Thursday (3/2/2005 and 3/3/2005) from 10:00 am to 5:00 pm. Users were solicited from the population of customers present in the library; we approached customers and requested their assistance with the tests. We performed the tests at a desk in the Business, Science, and Technology area of the library on a laptop with Camtasia video capturing software installed.

Sessions lasted for approximately 45 minutes, depending on user proficiency. We first presented users with a one page questionnaire in order to get demographic data and gauge experience with the catalog. The questionnaire and results can be found in the appendix. Users then performed a set of five tasks, first on one system and then on the other. With every user, we alternated between using InfoLinQ first and using AquaBrowser first. We requested that users describe their thoughts and what they were doing verbally. However, much of the users' time was spent reading through search results and most of the users appeared to exhibit a reluctance to speak more than necessary. The test administrator was available throughout the experiment to answer questions and to intervene when necessary. Afterward, we asked users a set of interview questions to gauge their reaction to the AquaBrowser system. The interview questions were open-ended, but the guidelines for the interviews can be found in the appendix.

Findings

Preferences Findings

- 3 out of the 5 users preferred AquaBrowser for all tasks. One user preferred AquaBrowser for some and InfoLinQ for others. One user preferred InfoLinQ. However, this user also encountered difficulty when using this system and ultimately chose incorrect records for two of the tasks.
- None of the five users thought at first to reformulate author queries to have the last name first. This result indicates a preference for AquaBrowser.
- None of the five users incorporated the visualization (the "word cloud") into their search. This does not show that users would never use the visualization; rather, this issue could be explored in greater detail. As a result, our tests suggest that users prefer AquaBrowser primarily for its search engine and to a lesser extent for the refinement feature.
- All five users searched for "*The* Secret Life of Bees" rather than "Secret Life of Bees." This result indicates a preference for AquaBrowser.
- There was a tendency among the users to utilize the exact language of the tasks when formulating queries. Working from a set of tasks introduces an artificial element into the experience, but at the same time, users often come to searches with unrefined queries. The result of this tendency were searches for "The Secret Life of Bees," "civil war poems," and "documentary movies about the civil war," for example. AquaBrowser is able to handle queries such as these, as is the keyword search in InfoLinQ.

Usability Findings

- The users often did not move from InfoLinQ's page that displays when there are no search results to a successful resolution of their query (instead, they would often start their query again from the beginning). More work could be done on studying what aspects of this page are confusing for users.
- The page in AquaBrowser that displays "Your Refine Options" (a page that displays in a new browser window when clicking on the "x more" link in refinements) is extremely large and was not successfully used by the user that found it. The large number of options and unknown ordering system may conspire to make this page difficult to use.
- Users expressed confusion over subject vs. keyword. It is possible that more could be done to differentiate these two ways of searching InfoLinQ.
- Based on all five of the user tests, it would clearly be beneficial for InfoLinQ to process all queries and remove any preceding articles. This would solve the problem encountered in the first task.

Conclusions

There are clearly opportunities for future work in testing AquaBrowser and in testing AquaBrowser against OpenLinQ. Our tests were performed within a single week, with planning, analysis, and actual testing compressed. One could perform a similar study to ours, but with more time to devise tasks in order to ensure that they are unbiased, to segregate the two systems so that the same user does not use both, and to perform the tests with more users.

Also, there is room for more usability testing with AquaBrowser. Our users did not utilize the "word cloud" in their tasks. We believe that users would require a larger and less well-formed task before they would begin to use the visualization; this would require more time and commitment from the users than we felt comfortable asking during this timeframe. One potential way to set up a test of AquaBrowser would be to give users questions that require a short answer so that users would need to synthesize information from multiple sources.

Appendix

Survey Questions

Please circle the age group that you are in:

Less than 18 18-30 30-45 45-60 60 or older

How often do you come to the library? (please circle the most appropriate one)

Once in 6 months or less Once or twice a month Once or twice a week

A few times a week Almost every day

How often do you use the catalog when you are at the library? (please circle the most appropriate one)

Never Not very often Sometimes

Every time I'm here Multiple times in the same visit

How often do you ask a librarian for help? (please circle the most appropriate one)

Never Not very often Sometimes

Every time I'm here Multiple times in the same visit

What sorts of things do you search the catalog for? (please check all that apply)

- ☐ I don't use the catalog
- ☐ Check to see if a book I want is at the library
- ☐ Check to see if there are more books by an author
- ☐ Trying to find the answer to a specific question
- ☐ Looking for books on a certain subject
- ☐ Reserving books that you would like to read

How would you rate your comfort with the current catalog?

Not comfortable Somewhat uncomfortable Somewhat comfortable Comfortable

Survey Responses

User #	Age Range	# Library Visits	Catalog Frequency	Librarian Frequency	Common tasks	Comfort level
1	30-45	1-2 per week	Sometimes	Not often	5	Comfortable
2	30-45	1-2 per week	Sometimes	Sometimes	2, 3, 5, 6	Somewhat comfortable
3	Less than 18	1-2 per week	Sometimes	Sometimes	2, 3, 5	Somewhat uncomfortable
4	30-45	Almost every day	Sometimes	Sometimes	5	Comfortable
5	18-30	1-2 per week	Sometimes	Sometimes	2, 5, 6	Somewhat comfortable

Task Times and Success

This table contains the approximate time for task completion when available. As this was not the focus of our experiment, we did not time these tasks exactly. Cells that are red indicate that the user did not successfully complete the task, either through choosing incorrectly or through not continuing to completion.

	InfoLinQ					AquaBrowser				
User #	1	2	3	4	5	1	2	3	4	5
2	1:40	2:55	2:30	2:00	2:20	2:00	6:20	:20	1:10	3:00
3	3:05	3:00	3:00	1:00	2:00	1:00	1:00			
1		2:00	2:00	1:00						
5	1:10	5:00	1:30	1:10	2:10	:45	3:45	:55	2:25	2:10
4	4:05	2:00	1:00	1:30	1:45	1:00	2:00	1:15	:40	2:00

Interview Question Guidelines

- What impression do you have of AquaBrowser?
- On a scale of one to five, how would you rate the usefulness of AquaBrowser?
- How would you rate the usefulness of the current catalog?
- How would you rate the appearance of AquaBrowser?
- How would you rate the appearance of the current catalog?
- On a scale of one to five, how easy was it to use the current catalog?
- How easy was it to use AquaBrowser?
- Do you have a preference for one of the systems?
- Are there certain things that you would use AquaBrowser for and certain things that you would use the regular catalog for?
- Was there anything that you had a particularly hard time with?
- Was there anything that you thought was really easy?
- Can you think of any ways to improve AquaBrowser or the regular catalog?

Descriptions of User Testing
User #1

Task1
InfoLinQ - The user typed "TheSecret Life of Bees" under Title search, and limited to only books. After correcting the error (spacing), he repeated the search. Because 'The' was included in the query, the catalog asks if you want "secret Life of Bees", and you have to click a title, author, or subject button. He wasn't clear what to do, and he instead clicked on "Browse nearest matches," but because the 'the' the title of the book was not on the list. He repeated the search but this time doing a keyword search, and not typing "the" in the query. Ho got the result. (He chose the sound recording, even though the book was also on the list, didn't read the description).

AquaBrowser - He type Secret life of bees, without the 'the' at the beginning (learning from the previous search) and the first result was the book we were looking for.

Task2
InfoLinQ - The customer searched for 'civil war poems' under subject and a subject list appeared but none that had something to do specifically with poems. He thought about what terms to use and then queried for 'poems', refining the search to only books (a subject search again). He got the subject list about poems but quickly found that it wasn't very useful, because none had to do with civil war. He went back and clicked on "power search" he typed 'civil war' AND 'poems' (keywords). He scrolled down the resultant list and found a book.

AquaBrowser - He typed 'civil war poems' and clicked on search button (pressing enter didn't do anything). The first book he got was a good book the included poems about the civil war.

Task 3
InfoLinQ - He searched for 'civil war' (keywords) and went over the list of results, which was a list of subject headings. Clicked on the civil war subject and the list of books given were about civil war (civil war in general and civil wars in other countries) but not many on the United States civil war. Even though we didn't specify what type of civil war, the customer assumed we meant the American civil war (which we did). He re-did his search by typing 'American civil war' (subject). There was only one subject heading on the list and went over the list of results. He found several books there.

AquaBrowser - He typed 'American civil war' and got good results about books on the civil war within the first 10 results.

Task 4
InfoLinQ - He typed the name of the author, only the last name. He clicked on the first result, but it was not Kevin Hillstrom but another author with the same first name. He went back back to the search window and typed the first name of the author too. The fourth book on the list was a civil war book.

AquaBrowser - He typed the name of the author, misspelling it at first. He went back to fix it, but removed the first name. He had to scroll down a bit more (10th result) but found the book about the American civil war by Kevin Hillstrom.

Task 5
InfoLinQ - The customer queried for 'civil war' in a title search, refining it to only videos and DVDs. He easily found a movie about the civil war.

AquaBrowser – He searched for 'civil war', and then refined the results by using the right side panel and clicking on movies. The first title was a documentary movie about the civil war.

The first user was a lot more interested in AquaBrowser, saying that it gave better results. He performed the tasks first on this system and then on InfoLinQ.

User #2

Task 1
The second user first performed the tasks on AquaBrowser. He entered the title of the book for task #1 into the search field and then scanned through the list of results. Although the appropriate book was the first search result, we believe that he took extra time because this was his first exposure to the system. When performing the same task in InfoLinQ, he did not omit the preceding article in "The Secret Life of Bees" and was slowed as a result.

Task 2
In the second task, he spent a great deal of time scanning through search results from the query "civil war." He entered his query, searched through the results for a great deal of time (and was the only user to continue to the next page of search results) and only then chose to use the refine feature (choosing first "books" and then "English"). He then searched through a similarly large number of search results. Ultimately, he entered a new query, "civil war and poems" and found an appropriate book. When conducting this same search in InfoLinQ, he again entered "civil war and poems" as a keyword search. He scanned through the results and looked at the record of an interesting book; however, he then clicked on the title of the book and was taken to a search for more books with the title "Selected Poems" and was ultimately unable to complete the task.

Task 3
User #2 did not complete this task in AquaBrowser, believing that he had previously fulfilled it in the second task. When using InfoLinQ, he performed a search for "civil war" as a subject and was able to click through layers of results until he found two appropriate books.

Task 4

For the fourth task, the user entered "Kevin Hillstrom" as the query for both systems. On AquaBrowser, this query produced a set of results which the user scanned through and located the appropriate book. On InfoLinQ, this query resulted in an error; the user hit the back button, read the instructions in the pop-up menu ("last name first") and reformulated his query to "Hillstrom Kevin." He was subsequently successful.

Task 5
On the fifth task, the user continued to use "and" in his queries on both systems. On AquaBrowser, he performed a search for "civil war and movie." He began to scan the search results, but then sought clarification of the task. He then reformulated his query as "movie and civil war" and found the appropriate record among the search results. When he subsequently did this search in InfoLinq, he entered "movie and civil war" as a keyword. He ultimately was unable to find a documentary about the civil war in the catalog.

User #2 stated that he liked the ability in InfoLinQ to specify author, title, subject, or keyword for a query, and indicated that he thought that AquaBrowser would be better suited to some tasks than others. Although he could not think of specific examples, it is likely from the results of testing that he was more successful using AquaBrowser for relatively unformed queries.

This user also displayed unique search behavior through the use of "and." Clearly, he learned this behavior from another search system and attempted to use it for these tasks. Although he did not utilize InfoLinQ's Power Search, we believe that he would have been comfortable with its use. Although AquaBrowser does not specifically support operators, it supported his method of searching.

User #3

Task 1
InfoLinQ - The customer typed "The secret life of bees" on the text box and did an author search. Of course it didn't give any results, but the system tells you if you want to make it a title or subject search (although is not very clear) so he clicked on the title button and browsed through the results. But the catalog had changed the query to "secret life of bees, the' so it didn't find a title by that name. He didn't actually find it but went to the next task.

AquaBrowser - The user typed "The secret life of bees" and the first result on the list was the desired book. Took less than a minute to complete.

Task 2
InfoLinQ - He limited the search to only books and queried for 'civil war poems', but leaving it to do an author search. He wasn't sure what to do, and after some hesitation decided to go back and re-do the search. He chose to do a keyword search - 'civil war poems' and looked through the list of results. He scrolled down and found a book about civil war poems.

AquaBrowser - He searched for 'civil war poems' and the first book in the list was a book about poems of the civil war.

Task 3
InfoLinQ - He did a subject search for 'civil war'. The result was a list of subject headings and wasn't sure what to do. It seemed like he wasn't expecting these results. He clicked on the 'civil war' subject; then scrolled through the list but did not find books about the American civil war. He went back and added 'United States' to the query (started typing American, but went for United States). The results now had some books about the US civil war.

AquaBrowser – Searched for civil war (just highlighting and removing 'poems' from previous search). The results showed a list of books about the American civil war.

Task 4
InfoLinQ - He did an author search for 'Hillstrom', limiting to only books. Clicked under Kevin, Hillstrom, and then found the book about the civil war.

AquaBrowser - Typed "Kevin Hillstrom" and the first book on the list was the book "American Civil War", by the author. The search engine seems to learn from previous searches and knows you are more likely to be looking for something about the civil war. Instead of being the 1st, it would have been the 10th if no previous searches were done and the first would be just the author.

Task 5
InfoLinQ - Limited to videos and DVDs, he preformed a subject search for 'civil war.' Clicked on the first heading in the list of subjects and then found a good movie this way.

AquaBrowser - Searched for civil war, then refined it as a movie, the first hit was a movie about the civil war.

User #4

Task 1
For the first task, the fourth user entered "The Secret Life of Bees" as the query in AquaBrowser. He spent some time looking at the search results, presumably because this was the first time he had seen the system. He ultimately found the appropriate record. When using InfoLinQ, he entered "The Secret Life of Bees" as an author search, and had to take time to study the resulting error page. We ultimately intervened and showed the user that he had searched by author. The user clicked on a button marked "title" that performed a search for the reformulated query "BEES THE SECRET LIFE OF." The user was confused by the search results and we intervened again to show him how to restart his search and how to specify a search by title from the beginning. He searched for "The Secret Life of Bees" again but was able to find the record.

Task 2
The user entered "poems about the civil war" in the search field in AquaBrowser for the second task. He began to scan the results but did not see anything relevant among the first few hits. After continuing to the next page of search results, he found an appropriate record. When using InfoLinQ, the user again entered "poems about the civil war" as an author search and did not understand the resulting error page. He clicked through some of the help options in order to redo his search as a subject search, and he scanned through the results. In the end, he selected a record that was not appropriate for the task.

Task 3
For the third task, the user entered "books about civil war" as a query. At first he began to scroll through the list of refinements, but abandoned that strategy and then began to scroll through the set of search results. We believe that he may have accidentally looked at the list of refinements. In InfoLinQ, he did a subject search for "book about civil war" and he scanned through the results. Ultimately, he restarted his search and did a title search for "civil war," and was able to find a relevant record.

Task 4
User #4 thought about his query before entering it; he eventually entered "a book about civil war by Kevin Hillstrom" into AquaBrowser. Clearly, he was influenced by the language of the task. The appropriate record was the first and only result. In InfoLinQ, he performed a title search for "Kevin Hillstrom," and then proceeded to restart his search. Next, he tried a keyword search for "book of civil war by Kevin Hillstrom" and was able to find the appropriate record among the results.

Task 5
Finally, for the fifth task, the user entered "documentary movie about civil war" in the search field, but produced no results in AquaBrowser. After telling us that he did not believe there were any documentaries in the catalog, we suggested that he try to reformulate his query. He searched for "documentary about civil war" but did not find a relevant record among the results. He searched again for "movie about civil war" but was unable to find a relevant result. In InfoLinQ, he did a keyword search for "documentary movies about civil war." This search produced no results, but offered help on how to proceed. The user clicked on a link for more help, and saw a page with a great deal of text describing how to perform a Browse Search. The user quickly restarted his search from scratch, and entered "documentary movies about civil war" as a subject search, and began looking through the results. He finally selected a record that did not meet the requirements of the task.

This user described a strong preference for the current catalog. However, although he perceived himself as successful with InfoLinQ, he was successful only 3/5 of the time on InfoLinQ, compared to 4/5 of the time for AquaBrowser. However, he felt that AquaBrowser had a slightly better appearance and that the appearance of InfoLinQ could be improved. Finally, he stated that both systems were easily approachable, which seemed to belie the difficulty he had encountered in his use of the two systems.

User #5

Task 1
The fifth user did the tasks first in InfoLinQ and then in AquaBrowser. For the first task, he entered "The Secret Life of Bees" as a title, which produced an error because of the preceding article. The user then attempted to refine by material type (specifically, book) and searched again. He scanned the results but did not find the appropriate record. He then hit the back button twice and entered "The Secret Life of Bees" as a keyword search. The audio version of the book was the first search result and he chose that one. On AquaBrowser, he entered "The Secret Life of Bees book," which turned up the appropriate record as the second rather than first result. Once again, the user spent some time simply examining the interface of AquaBrowser.

Task 2
For the second task, the user performed a subject search for "civil war." He scanned the results, but then hit the back button. He examined the ways of limiting the search by material type and ultimately chose to limit the search to books. He then examined ways to limit the search by language, but chose not to. He then performed the search again and examined the results for a long time. It appeared that he wanted to perform a search for civil war books and then find poetry among the civil war subjects. He then restarted his search, searching for "civil war poems." This search produced no results, so he used "civil war-poems" as a query, which produced no results. He then reproduced his search for "civil war" limited to books. After examining the results for a long time, he stated that he could not find an appropriate book. When this user performed the same task in AquaBrowser, he searched for "civil war." After looking at the results, he examined the ways to refine the search. He chose to limit the search to books, and then scanned the results. He looked at refinements again, and then clicked on "more subjects," which opened another browser window with a complete list of refinements. He scanned this list for a long time before returning to the first window. He scanned the results again and then performed a search for "civil war poems," which produced an appropriate result.

Task 3
The user performed a keyword search for "civil war" for the third task. He scanned the results and ultimately found an appropriate couple of records. When doing the same search in AquaBrowser, "civil war" produced a set of results which the user then limited to just books. He found appropriate records among those results.

Task 4
For the fourth task, the user performed a subject search for "civil war." He scanned the results, and then hit the back button. He then changed his query to an author search for "Kevin Hillstrom." This search produced no results, but gave him the option to reformulate his query to "HILLSTROM KEVIN." He did so, scanned the results, and found the appropriate record. For the AquaBrowser search, the user did not restart his query from the last task. He had previously searched for "civil war," and continued to work with those results. The user clicked on the "more subjects" link in the refinements

frame, and scanned the page of refinements that opened. He maximized the window, and proceeded to look at it for a great deal of time. He then closed that window. The user chose to sort the search results by author, and scanned the results again. He clicked on the "more authors" link and again looked at the list of refinements (this time focusing on the list of authors). He then closed that window and performed a search for "hillstrom civil war," which produced the appropriate record. This user is clearly resistant to reformulating his query and prefers to browse when possible.

Task 5

On the fifth task, the user first limited the search to video and DVD, and performed a keyword search for "documentary." The user scanned the results for a while and then hit the back button. He examined the pop-up menu to look at the limiters, and back at the paper with the task on it. He left the pop-up menu set to video and DVD, and then performed a subject search for "documentary." He scanned the results. When it appeared that he would not be continuing the search, we intervened and showed him how to perform his search. In AquaBrowser, he searched for "civil war-documentary" (perhaps having learned from the previous set of tasks) and refined the search results to limit them to movies. He scanned the results. When he did not find any results, he then chose to search for "civil war" and refined the search to just movies. He found an appropriate record among the results.

This user preferred AquaBrowser for his searches. He noted that the list of refinements in AquaBrowser was too long and, not being sorted alphabetically, were too hard to search. He also wanted more options for sorting beyond year, author, or relevance. On the other hand, he found the difference between subject and keyword in InfoLinQ confusing.