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**SearchAssist:
Revisiting the Mediated Search -
A New Model for Assisted Searching**

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Introduction

Today's academic research library contains an ever-expanding array of end-user search products. In recent years, libraries have concentrated on creating more search options for patrons, more full-text access, and Web-based document request and delivery services. Why, then, would librarians wish to bring back and market a mediated search service, given that mediated searching has all but disappeared from the academic arena?

Recently, librarians from the Research and Information Services Department (RISD) at the North Carolina State University (NCSU) Libraries decided to do exactly that, after theorizing that there may be a place in today's academic library for a search service and then investigating this possibility through a pilot survey to faculty. Although limited fee-based online searching was available at the NCSU Libraries, this service was not marketed and little used. After reviewing the survey results, these librarians ascertained that mediated searching might be a popular and valuable service if:

- the service acknowledged that patrons can do self-searching, but that there might be salient reasons for requesting a librarian-mediated search, such as time constraints or the need to explore multidisciplinary, interdisciplinary, or unfamiliar topics;
- the search service incorporated relevant 21st century features, such as linkage to

- bibliographic citation management software and other electronic tools; and
- the searches were holistic and not exclusively limited to online database searching, also locating relevant print sources, materials from licensed databases, and spatial, statistical, or numeric data.

Literature Review

In the early days of online searching, databases were too complex and search interfaces too difficult for untrained individuals to perform searches. When the first end-user products were developed, the subsequent literature reflected mixed feelings; articles showed a general unease about the role of the librarian in this new environment. One common theme found in literature of this period is acknowledgement of the threat that end-user searching might pose to librarians. Ojala (1985; p. 93) states that, to many librarians, end-user searching "signals the demise of corporate librarianship by diffusing the function of information gathering throughout the corporation, relegating the library to a book warehouse and interlibrary loan operation." On the other hand, Kuhlthau (1996) theorizes that, given an end-user system, there is still a role for librarians as intermediaries in situations where end-users have direct access to information systems. She theorizes that there is a "zone of intervention" in which "an information user can do with advice and assistance what he or she could not do alone" and that this is affected by "the complexity of the task, level of uncertainty, and stage in the information search process." (Kuhlthau, p. 91)

In addition to the new role of intermediaries, many authors point to the possibilities that exist for information professionals when online searching becomes less popular. Librarians, according to some, need to operate more in instructional roles rather than searching roles. Witiak (1988; p. 51) states that "by taking an active role in end-user training, intermediaries can enhance their positions as information specialists."

Following the initial fears, many studies focused on comparing quality of end-user searches with that of mediated searches, with differing results. White (1996) states that most library professionals instinctively know that librarian searching is more cost-effective than end-user searching and asks why there are no studies to demonstrate this. Lancaster and colleagues (1994) compared the search results of 35 searchers in an academic library in the ERIC database with searches on the same topic by experienced librarians and discovered that users found, on an average, only about one third of the relevant items, while librarians found closer to half of these items. End-users tended to be satisfied with poor search results with CD-ROMs. In contrast, "Information professionals generally utilized many more of the systems' commands, used more terms in their search statements, their searches had more stages to them, they persisted more with their searches, employed more access points, and they were generally more satisfied with their searches." (Lancaster et al., p. 372). While most of the literature found end-users less sophisticated searchers than professional librarians, some studies found that end-users were capable of performing the task. Sullivan and colleagues (1990; p. 27) studied doctoral students in both engineering and education at Stanford University and found that "Experimental subjects were no less satisfied with their retrievals, which were smaller but higher in precision than the retrievals produced by the intermediaries. End-users retrieved as many relevant references as the intermediaries."

In contrast to studies that compare search effectiveness of end-users to librarians, other literature focuses on the reasons patrons decide to become end-users or mediated search requestors. These articles are useful today because many patrons are potential users of both methods of searching, depending on the circumstances of the search. Crea et al. (1992) found that end-users were likely to first try self-searching and would only seek mediation if they could not locate the

needed information. Seago and Campbell (1993) surveyed patrons at the Medical College of Virginia who did both self-searching and mediated searching to determine why users choose one service over another and if perceptions of quality varied with the type of searcher. Reasons for selecting to do self-searching included personal preference, cost considerations, and the ability to browse results. Reasons cited for requesting a mediated search included perception of librarians' familiarity with MeSH headings and time constraints. Fifty-one percent of respondents indicated that librarian-mediated searches were of highest quality, 31% stated that self-searches were of highest quality, and 8% responded that both systems were comparable. Grigg (1998) interviewed mediated search patrons of the Environmental Protection Agency-Research Triangle Park (EPA-RTP) library to determine what factors motivated these patrons to choose either a mediated search or to self-search. Many of these patrons used both search methods. Reasons cited for doing one's own search included feeling that the search topic was too complex to explain to someone else, needing immediate results, and preferring to self-search. Reasons cited for choosing a mediated search included having little time to search, lacking confidence in one's own search skills, and dealing with a topic that was multi- or interdisciplinary in nature.

Literature on mediated searching is scarce in recent years, and often focuses on declining search statistics. Lancaster et al. (1994), Grajek et al. (1997) and Tenopir and Ennis (2001) all report declines in mediated search requests in academic research libraries. For example, Grajek et al. reported that mediated search requests at Yale had dropped by 96% over 10 years, while end-user searching increased by that same amount.

Recent literature has focused on rethinking the approach to the end-user vs. mediated searcher dispute and on survival in this new environment. Hewett (1997) and Fourie (1999) discuss the future of online searching and the end-user. Hewett's article described the University of Birmingham's review of the future of online searching after mediated searching sharply declined from 1991-1996. After this review, the University decided to continue the existing service, while simplifying the charging mechanism. In addition, the decision was made to "offer a specialized service via the Science and Engineering Team where the greatest demand for such services appeared to exist" (Hewett, p. 283). Part of this service would include referring patrons to appropriate end-user products and investigating mediated current awareness services. Fourie (p. 15) suggests that "if handled with care, disintermediation could be a golden opportunity for information specialists-but this will require critical self-reflection, refinement of existing skills, continuing expansion of new skills, and active research involvement."

Why might a mediated search service be attractive to today's faculty and graduate students? First of all, faculty are more time-constrained than ever. Kezar (2000) states that faculty workload continues to increase, and is, in fact, higher than that of many other professional positions. In addition, she points to the increasing prevalence of multi- and interdisciplinary research. As users are more time-constrained than ever, it may be helpful to choose to defer certain literature searches to librarians. Additionally, when the search service is staffed by reference librarians with varied subject expertise, the ability to assist users with multi- and interdisciplinary topics is enhanced, as different subject specialists are able to work on a request as a team.

Service Development and Implementation

To assess the level of interest in a mediated search service, a pilot survey of the faculty of the Chemistry, Food Science, and Zoology departments at NC State was conducted in May 2000. Of the 21 survey respondents, 8 (38.1%) said that they would definitely use the service, 10 (47.6%) were not sure, and 3 (14.3%) indicated that they would not use the service. Sixty-five percent thought that graduate students should have access to such a service. Of the 18 faculty members

who said that they would either use the service or were not sure, 15 (83.3%) selected e-mail (instead of print or diskette) as their preferred format for delivery of search results.

Because survey results indicated that there was interest in using a mediated search service, a proposal outlining the costs, benefits, and development process for such a service was submitted to the NCSU Libraries administration, and that proposal was approved. Feedback from the subject specialist librarians was also solicited during all phases of the service planning and implementation, since their acceptance of a service that could potentially increase their workload was critical.

As originally conceived, the service, called SearchAssist, was intended primarily for NC State faculty and graduate students, and university administration. The list of eligible user groups was later extended to include undergraduates engaged in research grants and projects, and research staff. SearchAssist was designed to include two main components: 1) one-time searching of electronic databases-or relevant non-electronic resources, when no electronic format is available, and 2) the establishment of current awareness profiles, whereby patrons would receive regular notification of recently published journal articles on their research topic.

Subject specialists would rely first on the databases already in the NCSU Libraries' e-resources collection (either by ownership or by subscription). Other, fee-based online database services would be used only if needed resources were not otherwise available. In a model similar to that of paying for interlibrary loan materials, the NCSU Libraries would absorb up to \$100 in search costs per researcher per semester; the patron would be charged for any costs exceeding that amount. To free both patron and searcher from the physical space of the library, electronic mechanisms for submitting search requests and delivering results were emphasized in the service design.

SearchAssist is highlighted on the Libraries' Web site at <http://www.lib.ncsu.edu/searchassist/>. This page includes a description of the service's features and benefits and a "Submit a Search Request" button. Because the service is limited to NC State faculty, staff, and students, patrons must log in and be authenticated as valid users before gaining access to the search request form. They are then asked to complete a simple request form by providing basic contact information and some additional details about their request: a description of the search topic, the preferred format for delivery of search results, whether or not search updates are desired, and form of payment (if applicable).

Requests are delivered to a central SearchAssist e-mail folder and forwarded to the appropriate subject specialist for the request topic. The subject specialist then contacts the patron via telephone or e-mail to conduct a reference interview before beginning the search. For each search, the subject specialist fills out a one-page checklist, recording the answers to key reference interview questions and other search-related data, such as the amount of time spent on the search, any search costs, and whether or not the patron asked to have results delivered in a format that could be imported into EndNote citation management software. The search checklist and the e-mail output from the Web request form are submitted to the RISD administrative secretary, who maintains a spreadsheet of search request data to be collected for service statistics. To protect patron confidentiality, search request topics are not included on the spreadsheet; only the recorded initials of the subject specialist(s) who conducted the search provide an indication of the search content.

Printed copies of the search checklist, the SearchAssist procedures, and the paper version of the search request form were distributed to searchers. The files for these documents were also placed in shared space on the computer network, so that subject specialists could print extra copies as needed. Later, printable .pdf versions of the checklist, procedures, and request form were also

made available on the NCSU Libraries staff intranet; this has made the documents more accessible to the subject specialists at the four branch libraries.

Results

SearchAssist was rolled out on September 4, 2001, accompanied by limited marketing including an article in the NCSU Libraries Newsletter, a notice in the "Spotlight" section of the library Web page, and a message to a graduate student electronic mailing list. Individual librarians did more targeted marketing, including a "Message from the Librarian" for some of the disciplines represented in the MyLibrary@NCState portal and an article in the Natural Resources Library newsletter.

In the first six months of the service (September 4, 2001 through March 3, 2002), 99 search requests were completed. Sixty-four (64.6%) of these search requests were from graduate students, 21 (21.2%) from faculty members, and 7 (7.1%) from university administrators. Another 7 (7.1%) requests came from patrons who identified themselves as staff members; however, one of these individuals, who submitted two requests, is also a graduate student whose search topics actually related to his graduate work, and two other requestors, one of whom submitted two requests, are librarians and therefore have faculty status.

The search requests came from 77 patrons. Sixteen patrons submitted more than one search request; five of these patrons submitted more than one request on the same date. SearchAssist also started receiving unsolicited "repeat" business during this period; 13 (16.9%) patrons submitted another search request after receiving results from one or more earlier searches. These repeat users included eight graduate students, two faculty members, two of the three incorrectly labeled "staff" members, and one administrator.

Search requests were received from 33 different university "departments": 23 (32.4%) of the 71 academic departments; and 10 non-academic departments or units, including Cooperative Extension, Learning Technology Service, and university administration. Education faculty and graduate students alone accounted for 26 (26.3%) of the total number of search requests. Those from the three departments in the College of Natural Resources submitted another 18 (18.2%) requests. Ten other departments in the physical or biological sciences, textiles, or engineering submitted at least one request, together accounting for another 15 (15.1%) of the total. The nine departments that submitted the most requests are shown in Table 1.

Table 1. Departments Submitting the Most Search Requests in the First Six Months of the Service.

Department	Number of Requests†
Educational Research and Leadership & Counselor Education	14
Adult and Community College Education	12
Parks, Recreation and Tourism Management*	10
Political Science and Public Administration	7
Business Management	4

English	4
Psychology	4
Forestry*	4
Wood and Paper Science*	4

† Of a total of 99 search requests during this period.

* Indicates that the department is part of the College of Natural Resources.

Not surprisingly, 85 (85.9%) search requests were submitted via the Web form. Patrons received e-mail delivery of search results for 97 (98.0%) of the searches. In other findings related to search results options, it was noted that most search requests seemed to result from a one-time information need; only 6 (6.1% of requests) patrons asked for regular search updates. Also, only 7 (7.1% of requests) patrons asked to receive search results in a format that could be imported into EndNote citation management software.

As expected, preparing for and conducting the actual searches required a considerable amount of librarians' time, ranging from 5 to 480 minutes per search. The mean time spent on a search was 148 minutes; the mode was 120 minutes. Of more interest was the finding that 27 (27.3%) search requests were either interdisciplinary in nature or were on a topic that was outside the patron's department or usual subject area; therefore, one or more librarians who were subject specialists for the search topic(s), rather than for the patron's department, handled the request. None of the searches required the use of a fee-based service.

Discussion and Conclusions

The increased availability of end-user databases has, in many settings, reduced demand for mediated searching and raised questions about the viability of mediated search services. The experience with a new mediated search service at the NCSU Libraries, where almost 100 requests were received in the first six months, suggests that a need for mediated searching still exists. A review of the NCSU Libraries' experiences with SearchAssist highlights several trends in terms of the reasons patrons request a mediated search, characteristics of users of the service, the nature of search requests, and desirable features of a search service in the current library environment.

Reasons for Using a Mediated Search Service

Mediated searching offers several potential benefits to patrons: increased access to databases and the professional skills of librarians, and convenience and timesaving factors. Many patrons (over 25%) seem to use SearchAssist when they are conducting research in multi- and interdisciplinary areas outside their comfort zone. One example is a plant science graduate student who requested information on the world market for plant proteins. This search was performed by the business librarian, rather than a life sciences librarian. Given the increasingly interdisciplinary nature of contemporary scholarship, this suggests that mediated searching may fulfill an important and growing role in research settings. Interdisciplinary searches also provide an opportunity for collaboration between librarians with different subject specialties.

In addition, feedback from an informal survey of SearchAssist patrons suggested that the "timesaving" aspect of the service is a selling point. Further, initial results indicate that patrons are

not likely to pay for search results. When patrons request a search, they are asked if they are willing to pay for the use of additional, specialized fee-based databases, but very few indicated their willingness to pay.

SearchAssist also provides an opportunity for a patron to request regular updates on their topic, although very few (6%) such requests were made. One possible explanation for this is that most search requests are based on one-time information needs; an alternative explanation might be that not all patrons understand the nature or value of this additional service.

Mediated searching is not only advantageous for patrons using the service. Librarians gain outreach opportunities to inform patrons of new research (current awareness) and information resources. A search service also highlights the value of the librarian and increases the library's visibility in supporting university research.

Surprisingly, for many patrons, use of the service involves a strong educational component. Patrons report using the search history, search terms, and lists of databases provided with their results as ways of learning how to improve their own searching. This is particularly satisfying for reference librarians in an academic setting where instruction is highly valued. It is also intriguing given the demographic breakdown of patrons (see next section).

Who Uses the Service?

One of the primary goals of SearchAssist is to support university research, and thus the service is focused primarily on faculty, graduate students, and administrators. A notable finding was that nearly two thirds (64.6%) of search requests came from graduate students. Many of these requests were related to thesis or dissertation topics. However, in some cases, requests involved course assignments. In fact, faculty in two courses referred their students to SearchAssist. This has generated lively discussion among librarians about how to balance the educational and service missions of the library for this user group.

Analysis of the disciplines and departments using the service revealed that the physical and biological sciences, textiles, and engineering departments together submitted only 15% of the total requests. This is surprising in light of Hewett's (1997) report about the University of Birmingham's conclusion that science and engineering subject areas would have the highest demand for a mediated search service and also because NC State is strongly focused on science and engineering. In contrast, a single college, Education, accounted for over one quarter (26.3%) of the total number of requests received. These patterns, however, are strongly influenced by marketing efforts, and many departments have not yet been the focus of targeted marketing.

The SearchAssist experience to date emphasizes the importance of marketing; greater numbers of requests have come from groups or departments that were the recipients of targeted marketing. For example, SearchAssist was marketed to graduate students by sending two announcements to an electronic mailing list. In addition, the service was marketed to the College of Natural Resources in both a newsletter and in several library instruction sessions; that relatively small college has generated 18.2% of the total number of requests (see Table 1).

Because marketing has had such a strong influence on the number of search requests, it is not possible at this time to draw conclusions about disciplinary differences in the use of mediated searching, as not all departments have received comparable marketing efforts.

Evaluation and User Satisfaction

A detailed evaluation of the SearchAssist service is tentatively planned for Fall 2002. During the early months of the service, an informal survey of user satisfaction was performed, and comments were generally positive. A very satisfied graduate student commented, "You saved me countless hours, the articles are terrific, and you were very expedient." Some comments focused on the timesaving aspects of the service; one faculty member said the service was "Very helpful for somebody who is very 'time challenged.' Now if you could just write my manuscripts for me the service would be complete ...". Other comments focused on quality of search results; a graduate student said, "I am very satisfied with this service, it came up with many more resources that I had not had the time to find nor found on my first several searches." In addition, 13 (16.9%) patrons have submitted additional search requests after receiving results from earlier requests, suggesting satisfaction with the outcome of these earlier requests.

Technology and Special Features of the Service

SearchAssist was designed to take advantage of electronic tools such as Web forms, e-mail, and citation management software. The vast majority of patrons have utilized most of these features: 85.9% of all patrons utilized digital means of submitting requests, and 98% utilized digital means of receiving results. A much smaller number of patrons (7.1%) requested search results in a format compatible with citation management software.

Summary and Conclusions

In conclusion, the initial response to SearchAssist at the NCSU Libraries has been significant and favorable and is expected to grow with additional marketing efforts. Preliminary results suggest that mediated searching is still a viable service, and is apt to be most useful in specific settings or situations (e.g., for patrons facing time pressures, or required to search in an unfamiliar subject area). One surprising finding was that, for many patrons, mediated searching played a strong educational role: teaching them by example how to improve their own searching. It is also clear that older models of mediated searching must be redesigned to incorporate recent trends in research, especially multi- and interdisciplinary searching, and utilization of technologies such as citation management software.

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