

# END-USER SEARCHING WITH CD-ROM DATABASES

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*This paper examines the impact of CD-ROM databases on end-user searching in libraries. It reviews several studies dealing with end-user response to CD-ROM database products and compares them with results of interviews with patrons and librarians in a local public library. It examines the importance of various factors in the successful use of these products and suggests ways in which CD-ROM software developers and libraries can increase the value of CD-ROM databases for end-user searching.*

## BACKGROUND

In recent years the use of CD-ROM database products in libraries has increased dramatically. In order to improve user access to these products, many libraries have increased the number of public access workstations with attached CD-ROM drives and/or networked existing drives to make them accessible from multiple workstations. The introduction of new CD-ROM based products, the use of multimedia, and improvements in both hardware and software have further expanded the popularity of CD-ROM technology. In light of these developments, it is important to consider whether CD-ROM products satisfy user needs. This paper will examine the factors that contribute to successful use of CD-ROM databases. In addition to reviewing the results of previous studies in academic libraries, personal observations from a local public library explore the issue from the perspective of the general library user.

Several university-based studies have reviewed end-user response to CD-ROM databases. A survey at Oakland University compared students' attitudes to CD-ROM and print indexes. The results showed a strong preference for CD-ROM over print versions of the databases. Most students found the CD-ROM products easy to use and were satisfied with their results. They tended to use the HELP screens of the products rather than asking librarians for assistance. However, the survey also indicated that the students were generally unsophisticated in their search strategies, suggesting the need for librarians to be able to provide bibliographic instruction, especially for those engaged in serious research (Schultz & Salomon, 1990).

A 1991 survey of research libraries in the U.S. and Canada found that CD-ROM database users prefer that medium to print because it is free, convenient, and allows self-service use. Of the various options for electronic searching, CD-ROM was the most used in the majority of libraries surveyed (Tenopir & Neufang, 1992a).

At the Penn State Great Valley graduate center library, the introduction of the *Business Periodicals Ondisc* (BPO) full-text CD-ROM not only resulted in a high degree of user satisfaction but had an impact on ILL (inter-library loan) requests as well. The availability of full text for many articles resulted in fewer ILL requests, making it more economical for document delivery. Students reportedly were so pleased with the CD-ROM technology and the full-text capability that they tended to ignore other resources which might be more appropriate, opting for convenience over content (Bane, 1995).

Another study at Illinois State University focused on the results of end-user searching in the ERIC database, comparing results obtained by library patrons with those obtained by intermediaries skilled in bibliographic searching techniques. The primary shortcoming of the inexperienced searchers was their failure

to use all of the terms necessary to perform a complete search. In order to improve the quality of end-user searching, the authors suggest that libraries provide search training for users as well as search aids. Additionally, the authors favor the use of alternative search approaches by vendors, such as natural language searching (Lancaster et al., 1994).

At Arizona State University the search habits of graduate and undergraduate students using both CD-ROM and online databases were compared. The results showed that simple searches were used in most cases by both groups of students, even if they had been instructed in more advanced techniques. Time spent per session was greater for the CD-ROM databases, with included abstracts, than for the online catalog, without abstracts. Familiarity with the software was found to decrease the time spent at the terminal as well. Approximately one-quarter of the students required either online help or staff assistance, in relatively equal proportions, suggesting that both are necessary (Anderson, 1995).

## OBSERVATION OF CD-ROM USE IN A PUBLIC LIBRARY SETTING

To examine end-user searching with CD-ROM databases in a public library setting, a medium-sized public library, located in a suburban Connecticut community of 60,000, was selected. Patrons at this library were interviewed after using one of the public access CD-ROM databases available on the library's CD-ROM LAN. Staff librarians were also interviewed concerning their perceptions of the use of CD-ROM databases by patrons.

### ENVIRONMENT

The CD-ROM LAN in this library consists of a Novell network with a file server and an optical server running Optinet. Five CD-ROM towers, four 4-bay and one 7-bay, are attached to the network, for a total of 23 network drives. In addition, there are two standalone drives, each connected to a single workstation, which house products not licensed for network use. There are eight workstations currently on the network, four of which are for public access. Two others are located at the reference desk, and the remaining two are in staff offices. The use of the available products is controlled through the Saber menu system, a software front-end product which provides workstation-specific menus for user selection of applications.

### CD-ROM SOFTWARE

The library's networked CD-ROM databases currently include EBSCO's *Magazine Article Summaries* (MAS), Proquest's *Newspaper Abstracts*, *American Business Disc*, *Compact Disclosure*, *The Hartford Courant*, *PhoneDisc*, *Contemporary Authors*, *ReQuest*, Baker & Taylor's *B & T Link*, and the 1990 U.S. Census. Standalone databases are *Dun's Million Dollar Disc* and *Discovering Authors*. Since all of the library's CD-ROM databases are from different vendors and most have different content and purposes, their interfaces also vary greatly. Most have a title or welcome screen followed by a main menu of functions or a menu of databases to search. A few, such as MAS, have a tutorial, which can be accessed from one of the initial screens by a function key or by selecting it from a menu. Since none of these products are Windows-based, there is no mouse for selecting options. Instead the arrow keys are generally used to highlight options and the "Enter" key to select them. Several of the products employ multiple interface types, most commonly menus for the initial screens followed by a prompt for entry of search terms. Some have different levels of features to accommodate different user abilities (MAS, *Hartford Courant*). *Newspaper Abstracts*, MAS and level 2 of the *Hartford Courant* database provide the option to browse an index of subjects or terms by pressing a function key (F6, F8, and F5, respectively). After the desired search terms have been entered, the search may be initiated by pressing a function key (F2 in MAS, F10 in Duns) or the Enter key (as in *Newspaper Abstracts*). The approaches to the display, printing and downloading of results are equally varied among

these databases. To compensate for the variation in interfaces among the various products on the network, quick reference guides for each product have been placed at the public access workstations.

### **SUMMARY OF PATRON INTERVIEWS**

Six different databases were used during the observation period. Of the twelve patrons interviewed (Appendix 1), half were using the selected database for the first time. All found the databases easy to use, although the new users required initial assistance from a librarian. Only two people used the on-screen help in constructing a search. A few seemed to think that the help feature referred to labels next to the function keys (e.g., F6=Print). The remainder said they did not need it.

With one exception, all felt that their searches were successful, although only three made use of features to narrow their searches and two of those simply limited a *PhoneDisc* search by city, state or some other field. Those who used products which offer abstracts or full-text, such as MAS, found this feature to be valuable. One person mentioned subject headings as the most helpful feature of the chosen software; one liked the ability to limit or qualify a search; another liked the ability to use multiple criteria in searching a business database. Other features mentioned included user friendliness, easy of use, speed, intuitiveness, and function keys.

Suggested improvements to make the products more user-friendly included initial orientation for new users to increase the comfort level with the product, more databases with full text, proposed related terms if a search term fails to come up with any hits, indication of local holdings, and more frequent updates. One asked for a mouse and icons. Half of the patrons either had used only one database or had no opinion about the different software interfaces. The other half seemed to be evenly split over whether all of the databases should have a common interface or remain product-specific. Most of the patrons interviewed said that they preferred CD-ROM based searching to using print indices or on-line searching because of ease of use or speed. Three felt that on-line searching offered more depth but still preferred CD-ROM to print.

### **SUMMARY OF LIBRARIAN INTERVIEWS**

Of the four librarians interviewed (Appendix 2), two said that patrons' questions were primarily navigational in nature. The other two felt that questions from inexperienced users were both navigational and concerned with search strategies. Common user problems reported by the librarians included discomfort with the technology, downloading information to disk, choosing appropriate search items, and not understanding what search options were available or how to use Boolean logic. The librarians felt that users generally preferred CD-ROM to other resources, considered it more user-friendly, and were satisfied with results obtained. One thought that patrons asked more questions about CD-ROM than print indices because they are more confident about knowing how to use a print index correctly (although this perception may not be true).

To the questions about improvements to or standardization of the user interface, most of the librarians responded that there was too much variation in the content of the databases for standardization of the interface with regard to searching. However, standardization of basic navigational functions such as scrolling, exiting from the databases, printing, or downloading was suggested, as well as improved on-screen instructions.

The librarians thought their influence on patrons' use of the CD-ROM products was substantial. They felt obligated to inform patrons of the resources available on CD-ROM since they might otherwise not be aware of their existence, unlike the OPAC (online public access catalog) or common print resources, which users expect to find in a public library. One of the library staff commented that if she directs patrons to a print resource, they will often ask if it is available on computer. In fact, one patron said that he felt more comfortable using a computer than a book.

## DISCUSSION

From the literature and personal observations in a public library setting, it is evident that CD-ROM databases are popular with end users. As the public becomes more computer-literate, there is less reluctance to the use of electronic resources in libraries. The fact that half of the patrons in the survey at the local public library were first-time users indicates a willingness on the part of the public to try this technology. Although this was a small sample of public library patrons using different database products and may not be representative of the entire user population, the responses agree with the results of the larger university studies previously mentioned.

The users of CD-ROM database products seem to be satisfied with the products and the technology, but perhaps too easily satisfied. From previous studies and the present survey, participants expressed satisfaction with their results from CD-ROM database searches. In the study comparing searching by end users and intermediaries, the authors commented: "It is rather disturbing that so many library users seem completely uncritical in their evaluation of CD-ROM. Many express satisfaction even when they achieve very poor results" (Lancaster et al., 1994, p. 382). Similar sentiments were expressed in interviews with academic reference librarians (Tenopir & Neufang, 1992b). In the BPO study Bane (1995), in reporting the tendency of students to limit the scope of their research to what is available on CD, emphasized the responsibility of librarians to lead students to the most appropriate resources.

While there are many variables involved in successful searching with CD-ROM databases, one of the most relevant factors is the software's user interface. Jacsó defines the user interface as "that part of the CD-ROM software through which users give their instructions to the system and the system displays results, messages, and explanations" (Jacsó, 1992, p. 9). Interfaces may be of varying types and styles, making use, to a greater or lesser degree, of menu bars, fill-in blanks, pop-up windows, and functions keys for selecting options, entering search criteria and navigating through the system. To make the software suitable for both novice and experienced searchers, some products provide different levels of available features. A new or infrequent user can perform a basic search without being confronted with unnecessary features, while someone wishing to perform a complex search can select an advanced level to access the needed capabilities. The selected level may affect output options as well as search options available to the user. On-screen user help is provided in varying degrees by virtually all CD-ROM database software, frequently by pressing a function key (usually F1). It may be context-sensitive or provide a table of contents from which the user can choose a topic. Some products include hypertext links to specific terms within a help topic, and some provide a tutorial to introduce the new user to the software.

The variations in design of CD-ROM products can sometimes lead to problems for the end user, especially when using multiple products with very different structures. To the extent that CD-ROM software developers make their user interfaces more "Windows-like" in appearance, the comfort level of users with these products will increase and many of the difficulties in navigating through the databases may disappear. According to Jacsó, "navigation ease and ease of use depend much on intuitivity. A system is intuitive when the action to be taken can be contemplated without looking at a help file or the documentation" (Jacsó, 1992, pp. 21-22). Greater consistency in the use of function keys and the terminology used to describe the various functions in CD-ROM databases may also reduce navigational problems. Ironically, only the use of the F1 function key to access HELP seems to be standardized among all databases. Perhaps the developers feel that if the user can get to the HELP screen, all of the other functions can then be explained. (This is equivalent to a vendor providing only a phone number for technical support instead of documentation describing how a product should work.) Anyone who has used various DOS-based applications with their myriad of command-driven interfaces can appreciate the consistency of the interface in Macintosh and, more recently, Windows applications, where basic functions are always found on the same menu regardless of the application. Yet standardization of basic functions and format does not preclude software developers from creating unique products.

The inclusion of abstracts and full-text in many CD-ROM database products has been well received by users, as previous studies and library observations have shown. The ability to read an abstract or article immediately after a search without having to go elsewhere in the library or use ILL to retrieve it, can represent a noticeable savings of time by the user and less involvement of the library staff. The additional time required at the workstation when using such products can be further reduced by the ability to download the search results to floppy disk.

In addition to the features of the software itself, factors such as workstation availability and location, adequacy and condition of the hardware, and currency of the databases may affect the ability of the end user to conduct a successful search. Even the attitudes of librarians can be important, both by making patrons aware of the CD-ROM products and by encouraging or discouraging their use. Lancaster et al. caution librarians against giving users the idea that CD-ROM products will meet all their needs with very little training. "To improve the results achieved by library users requires adequate user instruction in some form (a simple manual, personal or classroom instruction, or computer-aided instruction) or, alternatively, the use of effective search interfaces" (Lancaster et al., 1994, p. 383).

The availability of formal or informal training by librarians and written documentation for the products could also influence the successful use of a product. Although it may be possible to determine how to perform each function by carefully reading the on-screen messages, function key labels, and the user help screens, they can be confusing to some users, and even in a library, many people have an aversion to printed manuals or instruction sheets. (They also tend to disappear.) As this author's observations indicated, the need for librarian assistance is greatest among first-time users of a product. This is confirmed by Bane (1995), who reported that the majority of new users received informal instruction by the library staff.

The patron interviews at the public library confirm previous reports that the advanced search features of the CD-ROM products are seldom used. Although many of the CD-ROM products contain advanced search features or multiple user levels, few of the patrons interviewed used these features. Others have also found that students tend to perform free-text searches without developing a good search strategy (Schultz & Salomon, 1990). The predominant use of basic functions may be due to lack of knowledge of more sophisticated search capabilities. Comments from academic librarians suggest that the need for better bibliographic instruction for users is widely recognized, although lack of adequate computer training facilities may hinder implementation or success (Tenopir & Neufang, 1992b). While the results of the Arizona State study indicated that prior classroom instruction had little effect on search strategy, this same study noted that a number of students sought help, either within the software or from library staff, with finding alternate search terms or hints on search formats. Considering these factors, products should be designed to improve indexing rather than create more elaborate search engines (Anderson, 1995).

## SUMMARY

CD-ROM technology seems to be increasingly popular among library users. While both previous studies and recent interviews suggest that most end users are not sophisticated searchers, their acceptance of the CD-ROM technology indicates that they are willing to learn. With initial training users may become less reliant on library staff, at least for routine database operations. Improvements in the user-friendliness of software interfaces and standardization of navigational functions should make CD-ROM databases easier to use and allow users to concentrate on developing good search strategies rather than such mundane activities as how to print.

As the expertise of users increases, so do the expectations. With more databases containing abstracts and full text becoming available, user demand for immediate access to documents will grow. The availability and preference for the electronic version of documents will have an effect on print subscriptions and inter-library loan. It is important that CD-ROM database developers and libraries keep abreast of the changing

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attitudes and use of CD-ROM by patrons in order to offer the services which will meet both present and future user information needs.

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### APPENDIX 1 - QUESTIONS TO PATRONS

1. What CD-ROM database product(s) did you use today? Was this the first time?
2. Did you find the database(s) easy to use?
3. Was the product's on-screen help useful to you? How?
4. Did you require the assistance of a librarian in order to use the database or perform a search?
5. Do you feel that your searches were successful? Did you use the advanced search capabilities of the product(s)?
6. What feature(s) of this CD-ROM software do you find most helpful?
7. What improvements would you like to see that would make the product(s) more user-friendly?
8. If you use multiple CD-ROM database products, do you think they should have a standard user interface or should the user interface be product-specific?
9. Do you prefer CD-ROM based searching to print indexes or on-line searching? Why or why not?

### APPENDIX 2 - QUESTIONS TO LIBRARIANS

1. Are user questions regarding CD-ROM database products primarily navigational in nature or concerned with search strategies?
2. What seem to be the most common problems encountered by users?
3. How do CD-ROM products compare with other materials with regard to frequency of user questions and satisfaction with results?
4. How could the user interface to these products be improved?
5. Do you favor a standard user interface to all CD-ROM products, or should the user interface be product-specific? Why?
6. To what extent do you influence the use of CD-ROM database products by patrons?