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Too Many Concerns? Paper or Online, Local or Remote, Full Text or Index

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The proliferation of new electronic databases and search engines is delivering a host of new choices for librarians and system administrators. The problems presented by these choices are particularly difficult ones for small- and medium-sized academic libraries. Previously, one only had to decide what paper indexes to purchase and then whether the indexes were affordable. Now many indexes are available in a wide variety of formats so that the choices to be made have become much more complex. In addition, much more than single indexing has become available. Full-text online, on CD-ROM, or by document delivery is now an option to be considered as well. How can a useful decision be made among all the options now available? Librarians must consider the needs of the users as well as the options and budget available.

BUDGETING FOR RESOURCES: PAPER OR ELECTRONIC

A balance must be struck between the money that will be spent for online sources and that which will go to traditional paper sources. More and more libraries are canceling paper indexes in order to subscribe to an electronic version. When an index is made available in electronic version, the print version gets very little use as a rule. Cancellation of paper indexes was almost unheard of in libraries even a few years ago for a number of reasons. Academic librarians were suitably nervous about accreditation for various programs where subscrip-

tions to certain indexes were required. Today, when students and faculty are given appropriate access to the electronic version, paper indexes are not required for accreditation by most accrediting bodies. One small academic library in the San Antonio area made a dramatic change in its collection by dropping many journal and index subscriptions and allocating the money to a full-text CD-ROM system. This system is very popular with the students, but it is a single-user workstation and would not be a workable solution for a larger library, unless the dozens of CD-ROMs containing the full-text journal images were networked.

When extra funds are difficult to come by, as they are in most small libraries, current budgets must be reallocated in order to fund different materials. One way to consider allocating the budget is to institute electronic indexes on a trial basis and then study the use made of the electronic index and the paper index by the students. If twice as much use is made of electronic indexes as paper ones, the funds might be allocated such that twice as much of the index budget goes to electronic indexes as to paper indexes. A similar argument might be made for budgeting of full-text materials in online and in paper format.

Until recently, small college librarians were also wary of the inherent unreliability of computers and computer networks. Card catalogs and paper indexes never "go down" and so were much more trustworthy than computer-based resources. When electronic access is unavailable for long periods and at unpredictable times, good reference service requires a backup. This predicament kept many libraries subscribing to paper indexes along with the electronic counterparts. There is no substitute for reliability and if downtime is excessive and unplanned, the computer system needs closer examination. Appropriate downtime for maintenance and upgrades can be anticipated as part of normal operations, and the library should plan to be closed for major upgrades. In some cases, nights and weekends may be the time of choice for shutdowns on the grounds that fewer users will be adversely affected. Proper maintenance is most helpful in ensuring reliability, and upgrades are a necessary part of computer maintenance. When these caveats are followed, the improved reliability of current computer technology makes uncontrolled downtime less of a risk.

Most electronic databases are not available for purchase as paper indexes are; they can only be leased. Access to them is totally available or totally unavailable unlike paper indexes, which, once purchased, are owned by the library and are not returned if the subscription is canceled. Some librarians want to have physical materials to show for their expenditures, and these services provide nothing that can be retained. In most cases, nothing is left to store if a cancellation is made. However, CD-ROMs offer much better searching and take up very little space. They can, however, only be searched by one person at a time while multivolume paper indexes can be shared by several patrons. This limitation of CD-ROMs can be corrected, at a cost, by multiple subscriptions or by computer network access.

It is time to make intelligent collection development choices and select appropriate formats rather than simply duplicate resources. It has been our expe-

rience that if the network is unavailable, people do not use the paper indexes. They ask when the network will be in service and return to do their research then. We also find that people prefer to use an electronic index even if it is not appropriate to their needs, rather than a paper index that is appropriate. For example, many of our users, in researching topics for religious studies, will use the computerized *Humanities Index* on our network instead of choosing the paper *Catholic Periodical Index* or *Religion Index. Humanities Index* is an excellent resource, but the other titles clearly give better subject coverage. We need to compensate for these poor choices in our bibliographic instruction program by demonstrating how an online index, while easier to use, is not always the best choice for the user.

In order to take advantage of electronic resources, the library must have in place a reliable method of doing so and a budgetary plan for purchasing the electronic resources as well as the hardware needed. Many of the indexes used in libraries have become widely available in many different formats, so a library that makes them available electronically must consider dropping the paper subscription when enough computer access is available. Often, however, the cancellation of print indexes will not cover the price of a substitute computer index, so other funds must be made available. Many libraries have simply reassigned funds from existing book and journal budgets, while others have attempted to increase their budgets using the need for electronic resources as justification. Again, usage is the key and collecting usage statistics is very important for justifying budget requests. When an index strongly supports one or more disciplines that are important at a college, and it is used heavily by students, it should be purchased. Online or CD-ROM indexes save time and can produce better results; librarians must make decisions about funding based on concrete evidence of needs and usage. Keeping usage statistics online and sampling the use of paper indexes will provide the necessary information to help make decisions and justify budget requests.

Many academic administrators assume that money can be saved by accessing electronic resources, rather than by purchasing printed materials. This is usually a false assumption. First, equivalent electronic resources are generally far more expensive than their print counterparts. Second, the vast majority of recorded information is not yet available electronically. This is true for full-text book and journal resources, although computerized access to full-text materials is increasing rapidly. Traditional paper publishing is not withering away; on the contrary, it seems to flourish. Further, due to the fear by publishers of copyright infringement as well as other problems, much of this newly published material will not be available in electronic format in the near future. Several hundred years of published materials are also unavailable in electronic format. Electronic publishing is not going to eliminate the need for printed textual material, although it will reduce the need for searching through individual volumes of paper indexes.

REMOTE OR LOCAL ACCESS

Once the decision is made to purchase a particular resource in electronic format, consideration turns to the variety of formats available. For some databases, there is only one choice, but this is becoming the exception rather than the rule: should the database be locally mounted or made available by searching a remote site? Locally mounted databases require more local expertise as well as more local resources, such as hard disk space and processor power. Alternatively, remote resources are subject to high connect charges and sometimes to connection problems. These problems are exacerbated when indexes are accessed over the Internet. The best resources may become very difficult to access and use when Internet traffic is heavy. One would never wish to depend solely on Internet access for a heavily used resource. Library management may need to consider using a local area network and having a predictably heavily used index (i.e., ERIC) mounted on its own system.

Any sort of remote access should be verified for costs, reliability, and accessibility over a period of time. Remote access is probably most useful for lesser-used indexes though it may also be the best answer for all electronic access in small libraries without the expertise or money to build and maintain a large in-house computer system for local database access. There are a variety of remote database options available at the present time, including UnCover from CARL for journal indexing and the FirstSearch database service from OCLC. Telnet access on the Internet is currently free to UnCover, and the number and variety of periodicals covered is very large, though the searching capabilities are somewhat limited. There is also no actual indexing done on this database since it uses only the article title, author, journal title, and abstract terms as access points. Custom gateways are available for a fee. Ebsco offers a competing online product, Casius, which presents much the same information as UnCover, i.e., keyword searching of journal tables of contents. It is more expensive but offers better searching capabilities.

Access to FirstSearch is available either by purchasing blocks of a specified number of searches or through individual passwords that allow unlimited searching for a year. FirstSearch allows access to a collection of databases, which are generally well indexed as opposed to only allowing keyword searching of journals' tables of contents. A distinct advantage of FirstSearch over other collections of individual databases is the common search interface, which is fairly user-friendly. However, it can be much more expensive than the other alternatives. Dialog is an important source of online databases with a common search interface; however, the pricing structure of this service places it out of reach of most libraries for end-user searching. Usually, this service has been reserved for library-mediated searching, often with part or all the charges being borne by the individual user. Library service plans should include a standard for when mediated searching is preferred and when end-user searching is preferred. Mediated searching is usually used for expensive search services. Flat fees for unlimited

searching of databases are more easily budgeted for by libraries than for end-user searching.

LOCAL ELECTRONIC ACCESS: CD-ROM OR TAPE-LOAD

For most libraries, the best option for heavily used databases is local access, assuming the library and its parent institute are able and willing to invest the money necessary to build and maintain the supporting infrastructure. In this case, the choice of databases can be made in the library and by using traditional collection development guidelines: which users does the library support and what are their needs? In colleges, both circulation and use of current indexes are usually good guidelines. However, evaluate current use with caution since some indexes are difficult to use in paper format and thus are used less; they may be much easier to use in electronic format. There are also databases available that have no paper counterpart; they exist only in electronic form.

Local access to databases can be divided into access via tape-load or CD-ROM. Tape-loads of data on the disk drives of local public access catalogs have the advantage of giving a common interface for all databases, which is a considerable blessing. End-user training time is vastly simplified, reducing the workload for librarians. Tape-loads also have the advantage of being searchable in one pass; CD-ROM databases are often split into more than one disk and, in many cases, multiple disks cannot be searched at the same time. The online catalog computer must have vastly increased disk space to hold multiple tape-loaded databases as well as increased power to process complex searches and return the answer in a reasonable time. As a rule, CD-ROM access time is slower than that for accessing data stored on a hard disk—although the time spent on either search will vary depending on the processing power of the computer, the complexity of the search, the size of the database, and other variables.

The blessing of the common search interface of the public catalog can be a limitation. Often the CD-ROM search software is carefully matched to the database, thus providing powerful search capabilities. Many online public catalogs, however, offer only author, title, subject, and keyword access, plus the boolean operators "and," "or," and perhaps "not." The specialized search software of CD-ROMs often allows much more intricate search capability. For instance, one may wish to limit the search by year of publication, and then search material only in particular journal titles, or search only thesaurus terms. CD-ROM search software is generally well suited to the database it is paired with. Often, OPAC search software leaves much to be desired when it is used for searching journal indexes, because of its more limited searching options.

If a decision is made to purchase CD-ROM databases, a variety of choices must be faced. For example, will the CD-ROMs be placed on stand-alone work stations or will they be networked? Here the trade-offs are cost and access. Networks are more costly, but they allow several patrons to search at once.

While the trend in the industry seems to be toward unlimited access for networked databases, there are some publishers who base charges on the number of simultaneous users on a network, the number of workstations attached, or the total number of possible users of the database. Such restrictions can place a severe burden on the network administrator who must remain within the contract requirements and within the budget available.

It is preferable to decide which indexes will be most needed in the library, and then consider purchasing the CD-ROM product that is common to most of them. This will mean a single, main computer interface and will reduce end-user training time and librarians' training workload. Many indexes are now being introduced that have no paper equivalent; so if the library is considering replacing a particular paper index, close equivalents should be considered. Typical near equivalents often contain much more information than the printed index. When purchasing indexes of any type, librarians must consider their library's journal holdings and the holdings of nearby libraries, if users are able to access them. Even with high-speed fax machines and overnight document delivery, local holdings are still most convenient for users.

Other factors to consider in choosing a CD-ROM search product include ease of use for end users, memory requirements at the workstation, network installation and security requirements, the possibility of adding local holdings statements to the data, and the stability of the software. Search interfaces that are difficult for end users to grasp make a heavy workload for librarians. Software installation requirements can be a big problem, particularly for CD-ROM networking. Many CD-ROM systems allow users to exit to DOS, which can create a problem in networks. Others may require the capability to write temporary files to a particular network directory; some must be installed in the root directory; some require that particular software be installed on the workstation, such as a DOS "share" program or DOS extensions. Some are unstable in a network environment and "freeze up" periodically for no apparent reason. One of the biggest problems for CD-ROM networking is having enough available memory in each workstation to run the search engine. Some interfaces require only a minimal amount of conventional memory, while others require large amounts. Though workstations may have several megabytes of expanded and/or extended memory, DOS programs are still restricted by the first 640K of memory. Even with appropriate memory management, this can be a problem when the operating system and all the network drivers are loaded. Slow access time for CD-ROMs can sometimes be remedied by copying the database to a hard disk on the network server, if the producer allows this and if there is a large enough disk drive available. Copying the database consumes time and processor resources while it is being accomplished, but it provides some of the advantages of a tape-load onto an OPAC, and typically at lower costs.

FULL TEXT AND DOCUMENT DELIVERY

Getting the full text of a journal article, as opposed to simply the indexing and bibliographic information, is usually the goal of the researcher. When the library makes good indexing available in electronic format, it is much easier for the researcher to collect a large bibliography of useful citations. This increases the use of and requests for full-text materials. There are a number of ways to satisfy these needs in addition to the traditional methods of journal subscriptions in paper, microfilm or microfiche, or interlibrary loan. Some vendors such as University Microfilms International (UMI), Ebsco, and Infotrac are introducing ASCII full-text searchable journal and newspaper articles. Again, the library will often have a choice of whether to use remote, tape-load, or CD-ROM access for this. Most of the same considerations apply to this as to the decision on purchasing indexes in the three formats.

One drawback to these full-text databases is that most graphics, such as charts, graphs, and pictures are often absent. Searching a full-text database requires end-user training so users do not waste time and become frustrated browsing through hundreds of items that are only peripherally related to their searches. Full-text journal article access is also available in another slightly different format on CD-ROM from at least one vendor, UMI, through its ProQuest product. This access includes a traditional index to the articles on CD-ROM with links to "photos" or graphic images of the full text on another set of CD-ROMs. In this case, the full text is not searchable since it is present only in graphic format; however, all graphics are included in the product. Full-text access, however, tends to be fairly expensive regardless of format or vendor. The price for overnight document delivery during a test run of CARL and FirstSearch averaged $10–$12 per article.

Document-delivery services are an expensive option for fast delivery of full-text material. The table-of-contents services mentioned above, including those from FirstSearch, Ebsco, and CARL, all promise quick delivery of full-text journal articles. Sometimes these can be delivered within an hour by fax, while most promise same day or overnight delivery. All copyright fees are paid by the vendor and are included in the charge to the buyer of the service.

If remote access to databases by end users is seen as a separate step from document delivery, the ease of end-user searching, speed of access, and availability of appropriate journals in the database could be evaluated most strongly, with delivery capabilities as a secondary consideration. If document delivery is a primary process following end-user searching on locally held databases, then cost, reliability, and speed of delivery should be considered more strongly as factors in the decision-making process of choosing a document-delivery vendor.

MANAGEMENT DECISIONS

There are many factors that must be developed in the library plan for service and must be considered when final decisions are made regarding the purchase of indexes as well as full-text materials in various formats. The first five factors listed below are specific to choosing indexes, however, and the remainder apply to both indexes and full-text materials.

Collection Development Considerations
- Number of titles indexed
- Number of years covered
- Library holdings of titles indexed
- Indexing coverage (full or selective)
- Indexing quality
- Library holdings of other local libraries
- Curriculum subjects focus (research/writing or lab/classroom)
- Number of undergraduate students in the subject area
- Number of graduate students in the subject area
- Number of faculty doing research in the subject area
- Number of research-intensive assignments in the subject area

User Needs
- Scholarly research or casual use
- Ease of use
- Speed of access
- Availability to concurrent users
- Training needs of users
- Anticipated level of use (heavy or light)
- Anticipated level of downtime or unavailability

Cost Considerations
- Training needs of librarians
- Hardware needs
- Space needs
- Personnel needs (reference assistance, system maintenance, system administration, and so on)
- Supply needs (shelving, filing, paper, ink or toner, and so on)
- Cost to the library
- Cost to the user
- Security requirements

There is no one correct answer to the problems of database and document access for every library and every user. Each library must be evaluated according to the goals it sets for itself and the needs of its users. The factors discussed above should be considered for each database, balanced against the advantages and disadvantages in different types of access. Each access decision that is made

has repercussions on every other decision. It is necessary for librarians and system administrators to evaluate current access decisions against those made previously, in terms of new choices that may make a different mix of products a superior solution.

FUTURE VISIONS

When planning for future access, consider the direction your library is taking, the needs of your users, the options available, and the budget. Should you spend more on document delivery and less on journal subscriptions? Should you be receiving your full-text journal subscriptions on paper, microfilm, microfiche, or CD-ROM, or via online from a remote database? What choices will be available next year that may change everything? While planning for the future in a rapidly changing environment might seem almost impossible, it is still very important. You should develop vision of the direction your library will take and continue to develop that vision.

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