

ALTERNATIVES TO CD-ROM: ISSUES AND PROSPECTS¹

By Edward J. Valauskas

Abstract: Information on compact disk is convenient, attractive, transportable, accessible, professionally approved, and even recyclable. But libraries operate at a time when information is available in a wide variety of digital formats, such as tape or diskette. The same information in electronic form may also exist remotely on another institution's computer and network, where simply knowing how to ask for access may be the biggest problem. Paper-bound information, for all of its weight, space, and cost, is a viable alternative as well. For many patrons, facts, figures, diagrams, and abstracts bound in paper might represent the most desirable format of all. I will examine alternatives to CD-ROM from the perspectives of

- costs, that is the economics of digital information,
- currency, or the accuracy and age of digital information in different formats,
- impact, meaning the effect of CD-ROMs on the workplace,
- utility, the usefulness of electronic information compared to paper, and
- longevity, the vitality of CD-ROM as a technological solution to data storage and access.

Costs

In examining the costs of compact disks, there is a need to do a great deal of comparison shopping. Compare the costs of accessing information from a CD-ROM to accessing the same information from a locally mounted tape or online access to a remotely located database. The economics of this analysis includes a detailed breakdown of the subscription cost to a CD-ROM product, the equipment needed to provide access, and impact on staff to support it. This cost should be compared to data online or an alternative access to the same information, if it is available.

In the eyes of patrons, CD-ROM databases make information more accessible than online alternatives, thanks in large part to the absence of a meter. Patrons will use a CD-ROM more than an online service, especially one filtered by a database searcher. One study examined the costs of ABC-CLIO's databases on American history on CD-ROM and online. It was found that the annual license for the CD-ROMs was equal to the costs of 115 online searches, each lasting 10 minutes. In

the course of a year, one library only completed 27 searches in the online versions of these files. So it might seem a financial waste to subscribe to the compact disks if the information seemed so under utilized. But they never anticipated the enthusiasm of patrons for the same information in a new physical format, where the patrons completed searches on their own. In just three months, 159 searches were completed on the historical databases on CD-ROM. At that rate, in the course of a year the equivalent of 23.5 years' worth of online searches would be completed². Any analysis of cost must anticipate the impact of CD-ROM on the patrons' perceptions of access; experimentation with trial offerings of CD-ROM based files might be one way to see if format is a controlling factor in use.

It is important to take into consideration the sometimes neglected factor of the economic value of a database to a patron. What is the value of a compact disk if no one uses the information on it? It is important also to understand that you may serve different communities, with different abilities to pay for access. By pay, I mean not only cost in terms of monies out of pocket but also time and effort. Increasingly, studies on the economic value of information in libraries are focusing not only on the format of the information but also its location and its value to clients. Is the information available on tape and locally accessible over the network? Can a user reach a file over the Internet, and if so how easily? Is the CD-ROM search engine too arcane or too basic? These sorts of questions need to be addressed in any economic assessment of CD-ROM alternatives, and answers have to be found that place a value on services, time, and effort in terms of money. Let me provide an example.

At Clemson University in the United States, a study was made of the value of locally mounted tapes of information. Clemson is one of at least 150 colleges and universities in the United States that make information available to the communities via tape. An analysis of the fees and storage costs for several tape products provided a benchmark for the cost per search, which was used in evaluating the acquisition of additional tapes of different databases. A formula was devised taking into account the cost of each search, the number of anticipated searches, and the value of searches to students and faculty. Undergraduate students invested not a great deal of effort into learning new digital routines, so their price for a search was much lower than for graduate students and faculty. Different calculations were applied taking into account the uses of research and instructional files. This cost/benefit analysis gave Clemson the opportunity to place a value on online, tape, and CD-ROM services to its patrons. Overall, the value of locally available information far outstripped its availability remotely through database searchers. Additionally, for a database producer, the greater use of a database locally on tape means more revenue than from online use alone³.

Internet access is another form of database access that potentially can provide economic rewards to the library and its patrons. Access to the Internet needs to be widely available to all patrons as well as some degree of familiarity with the idiosyncrasis of Internet. Information over the Internet is less expensive relative to online thanks to the absence - for now - of telecommunications charges. If Internet access is widely available to patrons that means that a larger population of computers have access to information than possible through traditional commercial online services and CD-ROMs. It also means that you can take advantage of Internet connections to conduct searches without staff and patrons leaving the comforts of their respective offices by screen sharing⁴.

The costs of CD-ROMs and tapes have become increasingly competitive relative to online access thanks in large part to flat-rate pricing. When one price determines access, flat-rate pricing means more searches will be completed and more databases will be searched. For patrons and librarians that translates to more comprehensive searching and ultimately more information. In the words of one librarian on flat-rate pricing, "Now you can think online." Flat-rate pricing for CD-ROMs and tapes means not only that the demand for commercial online searches will drop, but also the use of printed sources. Unfortunately, all of this usage means the price of access will escalate at renewal time, often to unrealistic levels. At the Lane Library of the Stanford University Medical Center, a flat-rate contract gave the entire medical community unlimited access to MEDLINE. At renewal time, the new contract price increased incredibly high that the Library Director sought a second bid. Due to the usage patterns, the second bid was also too expensive. Relief to this problem was found by purchasing the data through a consortium of academic institutions⁵. A careful monitoring of cost provided a means for evaluating alternatives, and finding the best solution to satisfy the needs of the users and library budget. Any monitoring should include the apparent costs of information to users. They may view databases in print as free and transparent., CD-ROM as almost free but sometimes requiring a huge learning curve, and commercial online databases as never free of costs, intermediaries, and educational effort.

Currency

It's important to understand that economics should not be the sole factor in evaluating alternatives to CD-ROM. How current is the data on CD-ROM? How accurate is it? There are some simple tests that can be performed to answer these questions. Online databases are updated much more frequently than CD-ROMs and include a wider range of information. In some cases, some online files may present information well in advance of printed and CD-ROM sources. For

example, Scrip, a newsletter for the pharmaceutical industry appears in print twice a week; online it is updated continuously, Clinica, a newsletter on medical technology, appears digitally 24 hours before print versions and several agricultural newsletters can be read two weeks in advance of print editions⁶.

But even though online updates may occur more frequently, it is important to understand that the updates themselves may occur online at different times on different systems for the same file. MEDLINE may be updated by the National Library of Medicine on Wednesday, updated by DIALOG on Thursday, and by BRS on Friday. The frequency of updates may vary online; one vendor may update daily, another weekly, and yet another quarterly for the same file⁷. With a CD-ROM, an update may not arrive for a few weeks, or a month, or even longer. Because of this fact, certain information is appropriate to specific formats. For current up-to-date text from newspapers and newsletters, online access is more suitable than CD-ROM. For historical purposes and archival files of newspapers, CD-ROM is a much more natural medium.

Information may be dropped from a CD-ROM version of a product that's included in an online version. Don't assume that a CD-ROM product with the same name as an online product contains the same data. For example, the CD-ROM version Psychological Abstracts does not include technical documents and dissertations found in its online version. The CD-ROM version of Sociological Abstracts includes only journal articles and dissertations, dropping other kinds of documents found online⁸. These differences may or may not be of importance to your users, but they can be a source of irritation to those accustomed to the contents of a specific file in a specific format.

CD-ROMs may be updated three times a year, print format on a quarterly basis, and online six or more times in a year. Search commands may differ for the same file online relative to its CD-ROM version. One study of CD-ROM, online, and print versions of the Port Import/Export Service, a database of cargo leaving and arriving at all United States ports, found sizable variations in all formats. Product codes and indexing varied among the editions, meaning that experience in one format was no assurance of search success in another⁹. Perhaps the best response to a database with a bias is to provide a lot of different databases in a lot of different formats, all with their own idiosyncrasies¹⁰.

Impact

Compact disks in libraries have unexpected benefits and problems that need to be addressed. There is a misconception that CD-ROMs in the library free librarians for other chores. A survey of academic librarians in the United States and Canada

found that CD-ROMs in the library increased the workload for all parties involved, patrons and librarians. CD-ROM files require more time to understand their search engines and arrangements so that there is a longer learning curve for a CD-ROM database compared to its paper ancestor. Manual labor increases for staff, caring for computers, peripherals, and software and feeding printers paper. There's also a loss of physical space, thanks to computing equipment, manuals, and furniture. But in return, the survey found that users were more satisfied with their work and with the Library as a resource. To quote one patron "the immediacy of information is almost addictive¹¹."

Yet giving patrons more information may backfire. When patrons search CD-ROMs, their lack of sophistication can make their efforts frustrating. One study found that CD-ROM users who did not consult librarians and information professionals often selected the wrong compact disk database for a search; in one case, 70 percent of the users working at a CD-ROM workstation were using an inappropriate database¹². Nevertheless, patrons will prefer to use CD-ROMs rather than a print source or collaborating with a librarian on an online search, even though their results may be of marginal utility. When you make digital resources available, studies indicate that patrons will use these resources on their own long before coming to librarians for assistance¹³.

Utility

Patrons, in their rush to CD-ROM workstations, may not even realize that compact disks do not work like print. In the CD-ROM version of the English Poetry Full-Text Database - a collection of the works of over 1,300 poets working between the years 600 and 1900 - a researcher cannot check the proximity of one word to another across line breaks. Columbia University Press' CD-ROM version of Granger's World of Poetry includes typos and a dysfunctional search engine¹⁴. In addition, electronic text is unreadable for any length. There is sizeable aesthetic and physiological difference in the way in which we interact with text on a screen and text on a page¹⁵.

It will be some time before a computer will be as physiologically and aesthetically pleasing as paper. We will never hear of someone curling up with a good monitor to read in bed, or learn of an electronic book that's a real "window turner." The color, texture, smell and even flavor of paper cannot be duplicated digitally, yet. Fundamentally, paper based text and computer based text are used differently. Computers give us an ideal tool to search for information, to locate a needle in a haystack, if the search engine is created with some creativity and care. For meditation, reflection, and understanding, we need paper. We need to examine how we

use information on a computer and understand its difference from our rituals with paper in order to truly invent a utilitarian marriage of both media.

Longevity

How long is the lifetime of a CD-ROM? From a technical point, we've learned that there can be technical limitations but we are solving these. But sociological and economic factors affect the life span of a medium. Given the "fad" cycle of computing products, a new glitzy alternative may woo users away, e.g. the short life time of aperture cards and glass slides. Paper indeed may outlast compact disks as a viable medium. There are other options available for the distribution of databases, full-text, and multimedia. For example, high capacity coaxial cable has 250,000 times the capacity of a standard telephone wire. Access to full text seems a trivial problem with this sort of capacity. There are experiments underway right now to test access and control of this medium. For example, Tele-Communications, Inc. (TCI), the largest cable operation in the United States, is experimenting with video on demand in which users can select from a library of 1,000 films in their own homes. Imagine the possibilities of countless databases, texts, images, and other files available through this medium¹⁶.

CD-ROM is an important storage medium and an attractive, affordable medium for accessing and storing data. In conclusion, I have one last sobering thought. CD-ROM may be a passing technological phase as cable, satellite, and radio frequencies distribute greater and greater chunks of information at less and less cost to a larger and more diverse population with new kinds of appliances that we can scarcely imagine right now. It is perhaps appropriate to end this consideration of alternatives to compact disks with the words of Alfred Lord Tennyson¹⁷

Our little systems have their day;
They have their day and cease to be.

Notes

1. A version of this paper was presented at the 59th IFLA Council and General Conference in Barcelona, Spain on Thursday, Aug. 26, 1993, in the Workshop on CD-ROM Issues. It was published in an edited version in the Apple Library Users Group Newsletter, vol. 11, no. 4 (Fall, 1993), pp. 40-43. Portions are reprinted here with the permission of the Apple Library Users Group.
2. Tim Bucknall, "Searching Historical Abstracts and America: History and Life online and on CD-ROM", Database, vol. 15, no. 4 (Aug. 1992), p. 39.

3. Richard W. Meyer, "Locally mounted databases ... making information as close to free as possible," *Online*, vol. 16, no. 1 (Jan. 1992), pp. 15, 19-21. 23-24.
4. Thomas Keays, "Searching online database services over the Internet", *Online*, vol. 17, no. 1 (Jan. 1993), pp. 30-33.
5. Mick O'Leary, "Flat-rate online: a new online era begins," *Online*, vol. 17, no. 1 (Jan. 1993), pp. 34-36.
6. Ruth M. Orenstein, "Zero lag time: when online beats print," *Online*, vol. 16, no. 5 (Sept. 1992), pp. 60-61.
7. Carol Tenopir and Katie Hover, "When is the same database not the same? database differences among systems," *Online*, vol. 17, no. 4 (July 1993), p. 21-22, 25.
8. Diane Nahl-Jakobovits and Carol Tenopir, "Databases online and on CD-ROM: how do they differ, let us count the ways," *Database*, vol. 15, no. 1 (Feb. 1992), p. 42-46, 48-50.
9. Susan N. Bjorner, "Import-export reports: choose your output from online, disk, or CD-ROM," *Online*, vol. 16, no. 6 (Nov. 1992), p. 34-98.
10. Paraphrasing "... the correct response to a biased paper is a lot of other papers, with different biases." From Naomi Bliven, "Paper tiger," *New Yorker*, vol. 69, no. 2 (1 March 1993), p. 114.
11. Carol Tenopir and Ralf Neufang, "The impact of electronic reference on reference librarians," *Online*, vol. 16, no. 3 (May 1992), p. 54-56, 58, 60.
12. Rick Dyson and Kjestine Carey, "User preference for CD-ROMs: implications for library planners," *CD-ROM Professional*, vol. 6, no 3 (May 1993), p. 86.
13. Kathleen Crea, Jan Glover and Majlen Helenius, "The Impact of in-house and end-user databases on mediated searching," *Online*, vol. 16, no. 4 (July 1992), pp. 49-53.
14. Robert Potts, "But soft, through yonder Window," *Times Literary Supplement*, no. 4700 (30 April 1993), p. 7.
15. The aesthetic deficiencies have been described in the following manner by an editor of the *Times Literary Supplement*: "when you are actually reading real books, as much as you relish the flow and play of words beneath the eye and their alteration in the mind, there is also pleasure in their tombstone-likeness, in their being secure of change. Furthermore, you desperately want the author

to be at the center, you want to imagine the author there." From Giles Foden, "Fear of the glyph: between hypertext and hors-texte," Times Literary Supplement, no. 4700 (30 April 1993), p. 5.

16. Nicholas Garnett, "The Music industry: electronic delivery and copyright" paper presented at the World Intellectual Property Organizations (WIPO) Symposium on the Impact of Digital Technology and Neighboring Rights, Harvard Law School, Cambridge, Mass., 31 March-2 April 1993, p. 5-6.
17. From "In Memoriam" and quoted in Rreva Basch, "Annual review of database developments: 1992" Database, vol. 15, no. 5 (Oct. 1992), p. 48.

Edward J. Valauskas
5050 S. Lake Shore Dr.
3214
Chicago, IL 60615
USA