

# Information Migration

## CD-ROM, Web, or DVD?

by Amy M. Kautzman



ÒMake no mistake about it: The arrival of Digital Videodisk (DVD)-ROM is sounding the death knell for CD-ROM. Ó Lynn Haber (*Computer Reseller News*, 9/3/97).

ÒAfter blazing through multiple generations of speed increases, the CD-ROM race is about to come to a screeching halt. Ó Mark Hachman (*Electronic Buyers' News*, 10/27/97).

ÒThis talk of the demise of CD-ROM as a data delivery vehicle at the hands of the Internet is just so much baloney. Baloney today, baloney tomorrow, and baloney in five years. Ó Robert Starrett (*CD-ROM Professional*, 9/96:103Ð3).

A friend of mine, located in a library across town, recently spent \$15,000 for her library's powerful, large CD-ROM LAN. Today she is convinced that she has thrown money down the drain. She is convinced that CD-ROMs lodge somewhere close behind vinyl record albums and Beta video players in entering our collective memories as bypassed technologies. More than anything else, she desires an assortment of Web-accessible titles.

Another librarian I know will buy only CD-ROMs, even when economics and multiple-user options dictate Web access as the better option for his small student population. He has concluded that Web access is not secure. He believes that his systems people cannot support his needs and that the college that employs him cannot afford to invest in titles that are licensed for use, rather than owned by the institution. Of course, the latter situation can affect CD-ROM licensing, too. If librarians do not negotiate their way out of that bind.

Here in my workplace, I have begun going through my own technological growing pains. I find it hard to choose between CD-ROM or Web access for some titles. To complicate the problem further, I must deal with the issue of multiple users and multiple libraries. I have to choose between purchasing a single password account to a great online resource or gathering together the multiple libraries in my institution to hammer out an attractive group rate. Increasingly, librarians find themselves caught up in product-justification contests. More commonly, we deal with the issue of cost by turning to consortia to work out deals that single institutions do not have the power to swing.

For all of the technological *Sturm und Drang* that has infiltrated the hardware/software magazines, our

professional conferences, etc., it appears that CD-ROM has been given a premature burial. Instead of the dichotomy of Web vs. CD-ROM, look at format following function. Take a commonsense approach to the issues. Look at the functions you need and match them with which formats feed into that function.

### Situation-Driven Choices

I asked some fellow researchers at an investment firm how they received their data. Investment brokers know that knowledge is power. Brokers need the most up-to-date, cutting-edge information to inform their decision-making processes. Tracking stock and bond markets depends on real-time information. These high-speed, no-delay-allowed conditions impose demands some Web environments cannot support.

Another researcher at a consulting firm is a big fan of traditional dial-up-access databases. She needs the depth and speed of LEXIS-NEXIS and DIALOG via telephone lines. While CD-ROMs can support many of her needs, she finds that multiple resource databases do not realistically fall into a CD-ROM format. Could you imagine LEXIS full-text on a CD-ROM? One hundred discs? One thousand? Surprisingly she does almost no real-time research, and much of her analysis work replicates an MBA student's research. What she does need is reliability and speed, factors some Web environments cannot guarantee yet. As an information professional who works 9 to 5, she does not have the option of researching at 1 a.m. just to solve the problem of slow Web performance at 1 p.m.

Those of us in the academic/research world do not, for the most part, need

real-time information. Many of our users access the databases throughout the day and into the wee hours of the morning. Most important, the majority of undergraduates are flexible with the sources they use. At our library, we can pretty much guarantee satisfaction with *Moody's* on CD-ROM, *Value Line* in print format, or *OneSource* via the Web.

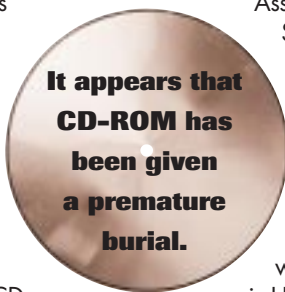
The broker, the consultant, and the academic all have different priorities concerning their service providers. While there is a shift to Web-based databases, the CD-ROM is still fighting the good fight.

### Where Will Trends Take Us?

What about the future? What may change the Web/CD-ROM split? Much legal research is accomplished using the Web, report Alice Lima-Whitney and Timothy J. Froemling in the *New Jersey Law Journal* (9/26/98:31).

ÒAccording to the 1997 American Bar Association Large Law Firm Technology Survey, 98 percent of large firms have Internet access available to at least some employees, and 97% use the Internet for legal research. Ninety-one percent of respondents use e-mail to communicate with their clients. Ó The question I'd like to raise is, which of the Web-based information is HTML-encoded and which is not?

According to an *Imaging World* article by E.J. McFaul (5/19/97:30), Web sites can now incorporate CD-ROMs as a way of presenting information. From a Web site, users may move through a seamless integration into a CD-ROM search. They may not even know in which format the data they search reside. For example, typing in a URL will bring up the home page of my library. The first page presents a selection of databases. Click on a specific highlighted link and *voila*, you are searching a CD-ROM.



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CD-ROMs have begun merging with Web information in other ways. The last HTML editor, a font package, Windows NT, or any other software program you bought probably came on a CD-ROM disc. Once CD-ROM recordable drives and disks become prevalent, you should be able to easily download updates, upgrades, etc., from the Web to the round silver disc. This quick upgrade could then be loaded onto a LAN or a stand-alone PC. Some CD-ROM publishers already do this. New Alloy Inc. has developed a system that allows developers to update CD-ROM materials via the Web. Look for more companies to join them and for much broader functionality.

While CD-ROM may not be the vehicle of choice for cookbooks or literary texts, it remains perfect for games, reference resources, and teaching tools. Elizabeth Henry Klampert writes that "many librarians use CD-ROMs to supplement their print collections; some are using them to replace items that may be heavily used but take up a great deal of space." (*New York Law Journal* 1/26/98:58) The Web has strengths that no one should ignore, particularly people in the information business. The two platforms make for a mighty combination. My suggestion is to take the best of both products and follow the basic premise: format follows function.

### The Death of the CD-ROM—Greatly Exaggerated?

Look around and you will quickly realize that the CD-ROM is not going to the Great Data-Yard in the sky without a fuss. The Web is the hot new frontier, but CD-ROM still serves us well; in some cases, better than ever.

Siobhan Roth reports (*Legal Times*, 1/26/98:S34) that "Watson & Renner, a D.C.-based firm with a branch in Denver, has no secretaries and considers itself a paperless office—nor as close to paperless as any office can be. All incoming documents are scanned and stored on CD-ROMs, and court filings are sent electronically whenever possible. So stringent are the firm's limits on paper that a typical client bill will include only a few dollars of photocopying fees." Not only does the use of recordable CD-ROMs save on physical storage space (one of a firm's pricier budget expenses) but it also saves on expensive data storage.

Another law librarian, Barbara Folensbee-Moore (*New Jersey Law Journal*, 10/6/97)

sees CD-ROM as a tool that fills the gap between print resources and online resources. As publishers move their products to CD-ROM, the costs have been reduced. Space and update cost savings have made the CD-ROM versions of casebooks, statutes and treatises more attractive. The ability to search across a wide range of volumes or publications has enhanced the researcher's ability to locate materials that in the past would have been much more time-consuming.

Just as books, microfilm, and other "antiquated" technologies still have their place in research and storage media, so the CD-ROM has crept into specialized niches.

### Web Competition

The primary difference between the silver discs and the Web is the CD-ROM's lack of flexibility compared to the Web. CD-ROMs are not as timely as the Web; they depend on a slow distribution system, and their capacity to deliver timely information is limited. Meanwhile the discs have become more intuitive, easier to set up and are greatly improved over those even a few years old. Remaining is the larger issue of requiring users to master the tricks of searching multiple titles using different search techniques. This is a problem shared by the Web to a lesser extent. The Web has developed a rough standardization where most searches appear to be derived from a similar searching ideal. For libraries and information centers, Z39.50 will further allow patrons to query look-alike databases.

Web access to information has grown exponentially over the past few years. The depth and width of the Internet has only begun to hit its commercial stride. There is little doubt that it will change publishing, information access, and product disbursement in ways that we cannot even begin to imagine. Even as it continues to grow, the Web has managed to escape the publishing prototype. The end product is not a single title sold for a standard fee—the case for most CD-ROMs. Instead, there are cost options taken from the online searching world echoing the Dialog, LEXIS-NEXIS, or Chadwyck-Healey models. Mindset, more than geography and technology, seems to limit pricing options.

The Web is attractive as a delivery service for a variety of reasons. Two advantages

to Web access are timeliness and depth. Another positive feature is the simplicity of the hardware requirements. All one needs are a fairly decent PC and a network connection. Business travelers do not need to lug or locate Zip and CD-ROM drives. Legal research online has taken advantage of the simplicity of the Web. Two examples are Thomas, a service of the Library of Congress which provides the full text of the *Congressional Record*, all versions of House and Senate bills, summaries of bills and information about their status, as well as other government information (<http://thomas.loc.gov/>); and the interactive Law Guru (<http://www.lawguru.com>), the Web site of the law offices of Eslamboly & Barlavi, which has gathered together 350 different search engines and tools that help to facilitate legal research.

It will not be long before more companies are imitating SilverPlatter. SP combines the best traits of both electronic formats by placing a CD-ROM on a server and making it accessible via the Web. By doing this, a company can put off transcribing decades worth of older material into HTML-formatted files. The best aspect is that we, as users, can connect via the Web for a seamless search. While one could view this as a transitional technology, it remains a great way to offer archived materials that do not change without having to wrestle with hypertext coding.

CD-R (recordable) is not in the public realm to the extent that I would like to see; however, the pace at which it is growing is impressive. Quality would make it as functional, and as inexpensive, as your average boom box. I hope that it will soon be as easy to press personalized CDs as to copy foreign language cassettes for French 101.

The Web is to CD-ROM what CD audio is to the cassette. While the reality of the Web may not always match the promise of its hype, it retains the constant potential to be extraordinary. It is a superior bit of technology. However, one does not necessarily need a laser gun to kill a fly. The CD-ROM, like the cassette, allows users to access only what they want at any given time.

This is not to say that the Web is out of control. I believe, as do most users, that



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the Internet is the future of information access and that it will allow unprecedented dissemination of information. However, it will never be everything to all users—just as the CD-ROM does not offer the vastness of resources, up-to-the-moment currency, or access from almost any point in the world. One's preference comes down to a need for a static information source (CD-ROM) vs. an active, renewable resource. One should remember the positive qualities of CD-ROM as naysayers run about foretelling its demise.

Like the ubiquitous Walkman, a CD-ROM drive now appears in most American homes whose owners have recently purchased computers. According to Robert A. Starrett (*CD-ROM Professional*, 9/96:103), "Five hundred million PCs will be sold by the year 2000. Ninety-nine percent of these PCs will have CD-ROM drives, which means that the installed base of CD-ROM drives will be more than half a billion by the end of the century." As long as people have the drives and the Internet continues to be hit or miss for substantial tools, whether income tax programs or the newest games, the CD-ROM will survive.

### CD-ROM Marketplace

More proof of the still-breathing CD-ROM market appears in a telling article written by Peter Kibby and Joseph Franzino (*Computers in Libraries*, 9/97:65D67). They examined the statistical breakdown of CD-ROM titles published in *The Multimedia and CD-ROM Directory*. This annual listing of CD-ROM titles and publishers has proved to be one of the primary tools used to order and track CD-ROM commerce. If the CD-ROM has begun failing as a product, as the hype would have us believe, then how do we explain Kibby's numbers? According to him, "Over 65 percent of the material in this edition . . . is new." Also, "the number of titles commercially available on disc has increased by 45 percent during 1996." Kibby and Franzino believe that industry growth is due to the falling prices of CD-ROMs as well as the growth of general interest and recreational titles.

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Paul Nichols seconds this argument in a recent article (*Computers in Libraries*, 11D12/97:59). He also cites statistics from *The Multimedia and CD-ROM Directory*, using the stats to reiterate how greatly people have exaggerated the death of the CD-ROM industry. He refers to the affordable cost of discs as partial proof of an accessible, stable market. "Almost half (46 percent) of all commercially available titles are now priced under \$50, and 69 percent are under \$100. A full 17 percent are under \$25. Only 13 percent of current CD-ROM titles are priced over \$500." Beyond the home market, we information professionals can also vouch for more realistic prices. As flexible pricing structures have become more the norm, we have begun paying for intellectual content and not for the searching and indexing software.

### The Internet

For many library and research departments, the fiscal bottom line determines whether one purchases a CD-ROM or a Web-based database. At a glance, it appears that mimicking the CD-ROM model is less cost effective. One needs to enter text, manufacture a physical product, and operate a purchasing/distribution system. This procedure follows the book publishing tradition, one that assumes the user wants to own the content of the CD-ROM instead of accessing only the material needed. A quick comparison, however, hammers home the higher cost of the "virtual" product. Web product developers have to begin with a powerful hardware infrastructure. They must maintain their computer systems 24 hours a day, every day of the week. The tools and products need to survive peak use periods without any glitches.

To complicate the mix, the product and its customers may depend on a varying quality of access environments that range

from T-1 lines to telephones and modems. Those of us in First World countries do not give much thought to the technological infrastructure (well, at least those of us in major metropolitan areas), but developing countries cannot take a quality online connection for granted. CD-ROMs, in contrast, have portability and a dependability that can easily match the optimum Internet connection. CD-ROMs can operate effectively under less than perfect conditions. We speak as users who know that the Net can be a very slow monster when accessed from home, during peak hours.

**In a truly democratic manner, legal scholars and militia troublemakers alike can have equal access to the U.S. Code on CD-ROM for \$37.**

For an in-depth article concerned with the economics of Web product development, read Lloyd Alan Fletcher's article in *Searcher* (5/96:30) on the costs of online information. The tidbit that caught my attention was a price comparison between different forms of information. Fletcher claimed that the "costs to deliver 1MB of information [are]: Online \$17, Print \$3.50, CD-ROM \$0.0024." Those numbers alone ensure that small and/or specialized content providers with tight budgets may not jump to the Web, if CD-ROM meets their patrons' needs.

The prospective growth in popularity of DVD (Digital VideoDisc) products could hurt CD-ROM sales. But I find it difficult to believe that DVD's dearth of titles and high costs will begin to affect the "Average Joe" market for a few years. CD-ROM drive manufacturers, on the other hand, may end up hurting the CD-ROM core audience.

### Race for Speed

Just a few years ago my library bought an 8x CD-ROM drive tower for our local LAN. It was so sleek and so fast and for about a month I actually felt as if I was on the cutting edge. Today it is commonplace to peruse the local Sears store and see 32x drives attached to affordable PCs. Unfortunately, the race for speed seldom reflects good performance and cannot guarantee that users get what they pay for. For this reason, and because the shadow of DVD has begun muting the desire for CD-ROM products, Mark Hachman reports (*Electronic Buyers News* 10/97), "Most manufacturers say the 32x drives introduced this fall will be their last hurrah."

In the coming year, they plan to abandon the market entirely in favor of higher-margin DVD-ROMs. Apparently, the lessons learned in driving school are true: speed kills.

Even if Toshiba or Hitachi quit updating their CD-ROM products, the market would not be quelled. In fact, some users may give a big sigh of relief that they do not have to play technological catch-up in the no-win, fastest machine race. Once big name manufacturers drop out of the CD-ROM speed race, no-name companies will step up to the plate and sell designer knock-offs at a fraction of the going price. The wild card in the equation concerns the decisions of computer manufacturers on what technology they will bundle into the peripherals going out with their PCs. If the sellers decide to switch to DVD-ROM to take advantage of multimedia options, or CD-Recordable to handle back-up difficulties, that decision could, over time, give an alternative technology dominance. One way or another, however, unless network computers somehow take over (not likely), some form of optical storage will remain present on most computers.

### Hybrid Titles

Against the argument that lower CD-ROM prices stem from desperate manufacturers hoping to flood the market with worthless inventory, Nichols (*Computers in Libraries*, 11/12/97) explains that CD-ROMs are happily piggy-backing onto the Web marketplace with 600 hybrid titles. A hybrid title is a CD-ROM that has the value-added feature of Web access. The CD-ROM allows entry into a Web site that offers more in-depth or updated information or games. CD-ROM encyclopedias are taking full advantage of the timeliness of the Web by inserting links to impressive sites or updated entries. In theory, the Web-connected encyclopedia will never go out of date. The hybrid CD-ROM-Web access allows the CD-ROM title to stay current while ensuring a paying audience. For while the information on the disc itself remains static, for a small fee the publisher will offer more products via the Web. Both the user and the publisher come out ahead. The publisher builds brand loyalty and gathers additional revenue from advertising dollars by hitting a target

audience. Meanwhile users feel as if they have access to the most up-to-date product via the most modern of telecommunication tools.

### The Publisher

CD-ROMs will not disappear for another vital reason. Though the federal government pours more and more data onto the Web, it also continues to be the world's largest CD-ROM publisher. Judith Lamont (*Computers in Libraries*, 11/12/97: 64-67) has recently reported on how the federal government makes excellent use of CD-ROMs by offering the discs at very affordable prices. For example, the federal budget is available on the Web or on a CD-ROM. Scholars might prefer to pay the low price of \$16 for the CD-ROM and not have to worry about Web response time as they read the President's Budget Message and all of the other texts and worksheets. In a truly democratic manner, legal scholars and militia troublemakers alike can have equal access to the *U.S. Code* on CD-ROM for \$37.

If you are not familiar with all of the available titles, use the Web to access two of the largest government publishers. The GPO's (Government Printing Office) URL is <http://www.gpo.gov> and NTIS's (National Technical Information Service) URL is <http://www.ntis.gov>. The Web sites will offer full-text access and a list of all items available in the CD-ROM format.

### DVD-ROM

Even if we all agree that the Web can co-exist peacefully and profitably with CD-ROM, we have to look at the horizon and consider the threat of DVDs. The DVD comes in two general flavors. The DVD for the home audience focuses on capturing the video disc and video rental market by putting out superior multimedia entertainment extravaganzas. The other, less sexy, but more interesting disc is the DVD-ROM, an item much like the CD-ROM, that has the added ability to carry

information on both sides of the disc along with the capability of compressing more data onto its surface. I would like to counter the threat of the DVD by suggesting that DVD products will help to draw out the life span of the CD-ROM.

DVD players can interpret CD-ROMs, ensuring that the market for CD-ROMs will not fall as quickly as the market for 8-track tapes did. A few technologically brave souls will purchase the first round of DVD players, but their debut this past summer did not set any sales records. Like most transitions, this one will take a bit of time. The popularity of DVD depends on the price of the DVD players dropping and the selection of titles expanding. While we wait for this process to take place, the cost of CD-ROM drives will become dirt cheap, titles will abound, and the first round of people to buy DVD players will end up playing their CD-ROM titles on their shiny new toys. Until DVD titles exist in large numbers, the public will probably not start purchasing the more expensive machines.

Microsoft is the primary reason that DVD titles are slow to hit the store shelves. Once again the 800-pound gorilla is in control of industry standards. Windows 98, which is months behind schedule, will feature a new application programming interface (API). The API is a universal architect for capture, control, processing, and playback of multimedia streams. Software producers are holding back on pressing their discs until they are assured as to the compatibility of their product with Windows. Once this technical glitch is cleared up, there should be a flood of fascinating DVD titles. Of course, we've all heard this song before.

Ultimately some recordable optical format will finally reach mass marketing, though CD-recordable and other competing formats have floundered or failed in the past. Recordable DVD technology will have the extra selling point that it could replace VCRs as well as CD-ROMs, not to mention tape backup systems, ZIP and JAZZ drives, and other computer storage media. An article by Laurie J. Flynn, in the *New York Times* CyberTimes section (11/30/97: <http://www.nytimes.com/cyber>), discussed the problems of recordable DVD technology. As in the past, different manufacturers advocate different, incompatible formats. As of December 1997, three formats wrestled for buyers' limited attention span. DVD-RAM, backed

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predominantly by Toshiba, Panasonic, and Hitachi, can store 2.65 gigabytes on drives that cost around \$800. DVD+RW, defended by Philips, Mitsubishi, Ricoh, Yamaha, Sony, and Hewlett-Packard, can handle up to three gigabytes and costs around \$17,000 per drive, but should go down to \$5,000 by the end of 1998. DVD-R/W from Pioneer Electronics can store 3.95 gigabytes and will cost \$17,000 per drive, though Pioneer expects the price to drop to the \$3,500 range by the end of the year, according to Flynn.

### **In Closing**

Obviously, the debate over the one best accessing tool will not stop anytime soon. The Web has certain advantages over CD-ROMs, but the converse also holds true. The only truism is that technological change is a constant and has been since before Babbage's calculating machine. As information professionals, we need to keep ourselves abreast of changes and recognize our needs and priorities. By taking into consideration our audience and their needs for timeliness and

accessibility, we can then weigh their needs against the costs and features of the tools offered to us for purchase. At this point, we have to make the best decisions we can with the information we have. Good luck to us all.

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