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**INSPEL** is a professional journal primarily for the dissemination of papers written or proposed for publication by members of the IFLA Division of Special Libraries. The Division promotes and coordinates the work of particular relevance to the specific types of libraries or library activities in its Standing Committees for Art Libraries, Biological and Medical Sciences Libraries, Geography and Map Libraries, Government Libraries, Science and Technology Libraries and Social Science Libraries.

The Journal is directed to an international readership among librarians in government and international agencies, as well as in universities and research institutions. Librarianship is a key subject in a rapidly changing world. Improved practice will help produce economic benefits, and special attention should be given to problems concerning libraries in Developing Countries.

Articles will be drawn primarily from activities conducted within IFLA. But on occasion the Journal will publish articles on specified topics by non-IFLA contributors. Any reader interested in preparing such an article is invited to submit the paper to the Editor. Material on all aspects of librarianship will be considered eligible for publication.

The views and interpretations in articles published are those of the authors and do not necessarily represent the policies of IFLA or ASpB.

Comments or brief notes responding to Journal articles are welcome and will be considered for publication to the extent that space permits.



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## FOREWORD

On the occasion of the 59th IFLA Council and General Conference in Barcelona (Spain) August 22-28, 1993 the Section of Social Science Libraries sponsored a workshop on CD-ROM issues. This edition of INSPEL gathers the presentations, several of which have been rewritten, as well as an introduction by Bill Bartenbach, the organizer and chairman of the workshop.

The editor

# **CD-ROM CHALLENGES AND OPPORTUNITIES: ISSUES OF CONCERN TO LIBRARIANS - AN INTRODUCTION**

**By Bill Bartenbach**

## **Introduction**

No other new technology has so captivated the library and information community in recent years as CD-ROM (Compact Disc-Read Only Memory). Since the first commercial products became available in 1985, there has been a tremendous growth in the number of CD-ROM producers, vendors and titles. Surveys of CD-ROM database titles show growth not only in titles reaching the library community but also in titles for the home, with no slowdown in sight. Fixed costs, ease of use, and the absence of the psychological pressure of the ticking meter has encouraged libraries to make CD-ROM searching available to their patrons. Both librarians and patrons have embraced the new technology and the library literature is full of success stories. In many ways, librarians are now challenged to deal with a popular technology. At the same time, issues have emerged that are of concern to librarians. Some of these issues were addressed in the CD-ROM workshop entitled, "CD-ROM Challenges and Opportunities: Issues of Concern to Librarians." The workshop was sponsored by the Social Science Libraries Section of IFLA during the 1993 IFLA Conference in Barcelona. This introductory paper is a condensed and revised version of a paper previously given at the International Conference on New Frontiers in Library and Information Services, held in Taipei in May 1991. The paper will address some of the CD-ROM issues that are of concern to librarians.

## **The Need for Planning**

The growing popularity of CD-ROMs poses challenges that require careful thought and planning. Therefore, it is worthwhile to examine some of the implementation issues brought about by the growing number of CD-ROMs in libraries. Implementation requires assessment of the changing, emerging technology and planning for the future.

In comparison to online searching, CD-ROMs have made financial planning easier for library administrators, because expenditures are predictable and thus

can be incorporated into the annual library budget. However, there is real concern among librarians, working under severe budget constraints, regarding the costs of CD-ROM discs.

### **CD-ROM Networks**

Many libraries have implemented or plan to implement CD-ROM networks. CD-ROM local area networks allow multiple users at different locations convenient access to multiple databases, in a secure environment, at a lower cost for hardware and software than multiple single-user workstations. Providing access to CD-ROMs from any workstation connected to the network not only pleases the users but also eliminates the loading of software on every workstation. Convenient access and ease of use may also help library administrators to obtain funding for CD-ROM networks.

Difficulties regarding networks fall into two categories, technical and legal (or licensing). The acquisition, installation and ongoing use of networks are complex and require a high degree of technical expertise. When the technical difficulties have been overcome there are still legal questions to be resolved. Database producers and vendors have developed licensing policies for CD-ROM networks but have not been able to arrive at a standard policy.

### **Network Security**

When a library makes a large number of databases available, security becomes a major issue. Networks permit permanent mounting of CD-ROM databases in nonpublic areas, allowing only authorized library staff control over the databases and thereby minimizing the number of persons having to handle the discs. Multiple CD-ROMs on a network require a menu system from which the user can select the appropriate database to be searched. Menus also fulfill a security function. They help to avoid or reduce error messages, end keyboard lockups and can prevent users from exiting to the disk operating system (DOS). Preventing users from getting into DOS protects programs and data files. Users could create havoc in these files or contaminate them with computer viruses.

### **Usage information**

Many networks include software that tracks the usage of the various CD-ROMs, providing valuable management information that can be useful for reference work and in collection development decisions. Usage can be tracked for each database by day and aggregated by week, month and year.

## **Network Performance Issues**

There is general agreement that multiple access to the same CD-ROM disc slows down response time. Library administrators need to make a careful evaluation of the performance of local area networks.

Tests show that as the number of simultaneous requests go up response time slows down. It is, therefore, not surprising that some libraries opt for site licenses of the magnetic tape to offer databases through a network connecting to their mainframe computer. It provides simultaneous access to a larger number of users at a faster time.

Silver Platter, a CD-ROM vendor, makes available databases on CD-ROM which can then be loaded onto a magnetic system using an automated copy procedure. Searching is up to ten times faster than CD-ROM, and up to 25 users can search the same database and multiple years simultaneously.

## **Dial-in Access**

Students and faculty have asked for dial-in access. It is natural that patrons would like to have the greatest possible convenience to access databases from their dormitories or offices at any time of the day. Dial-in access requires a terminal or personal computer with a modem, a phone line, remote communications software and passwords to prevent unauthorized access. At the library a host computer is needed that will accept dial access and process the information entered at the remote workstation. Dial-in access presents a host of technical problems, therefore, it is advisable to engage a consultant, if technical expertise is not available in-house.

## **Document Delivery**

It has been said that some libraries operate with 20th Century bibliographic retrieval systems that make citations instantly available and 19th Century text retrieval systems in which the item needed is often not available locally and may take weeks to obtain.

The ease of obtaining bibliographic citations has brought with it increased demands for full-text documents. It is quite natural for a library patron who has found the bibliographic citation to expect the library to supply the actual document. Library patrons become easily frustrated if they cannot obtain the full text and exert pressure on libraries and database producers to make the delivery of the full text more easily available.



## **Inter-library Loan**

Online searching has stimulated heavier demand for periodicals and for interlibrary loans. The same development has been extenuated by the introduction of CD-ROMs and librarians report a substantial increase in inter-library loan requests. Coincidentally, interlibrary loan librarians report that the quality of bibliographic citations has improved. In many cases, they receive the computer printout of citations from the various CD-ROM databases.

## **Fax transmission**

Inter-library lending has traditionally been a slow process although the fax revolution of recent years has provided opportunities for quick delivery of information. Unfortunately, most libraries still have to go through the tedious process of photocopying, to be followed by fax transmission, sometimes to be followed by a second photocopying at the receiving library, due to the fact that print on thermal paper has a tendency to fade, making documents illegible over time.

## **Full Text on CD-ROM**

CD-ROM has been an excellent publishing medium for bibliographic citations. However, bibliographic databases have also made library patrons aware of the limitations of their libraries. Publishers have responded to the need for full text information by providing it in microform format, online, and more recently on CD-ROMs.

The advantages of combining bibliographies and full-text on CD-ROM are obvious. At a single workstation it is possible to search for the bibliographic citation and to retrieve the full text instantly. It is a very efficient way of doing research as it reduces both time and frustration of library patrons in searching and locating information. The patron does not have to go through the time consuming process of looking for the journal issue, is not frustrated by missing or mutilated issues and does not have to spend time at the photocopying machine. It also reduces the time required for library staff to assist patrons in locating information or to deal with it in the Interlibrary Loan Service.

The disadvantages of full-text on CD-ROM are in their lack of currency and browsability. CD-ROMs are usually behind printed publications and cannot be browsed as easily as their printed counterparts. CD-ROM full-text databases will place an additional burden on librarians to educate users which titles are available in print, which ones are on microforms, and which ones are on CD-ROM. It is

also possible of course that journals may be available in all three formats, with different starting and ending dates.

### **ASCII Full-Text Databases on CD-ROM**

There are two ways of making full-text information available on CD-ROM, as ASCII files or as image databases. The advantage of ASCII files is that they are searchable. However, graphs, charts, chemical and mathematical symbols present difficult problems for ASCII files and the databases generally exclude them.

Halftone illustrations are impossible to include in ASCII files. Although it is possible to search ASCII files, searching of fulltext databases can be very difficult. It is generally agreed that the sheer volume of uncontrolled vocabulary terms in the database will lead to excellent recall but very low precision in searching.

### **Image Databases**

Digital scanning is used to obtain high quality images of document pages. The pages are exact replicas of the original magazine article, including all illustrations. Exact images are achieved by a process called bit-mapping, whereby the laser scans a page from left to right and produces a bit stream of zeros and ones. Scanned images require substantially more storage space than ASCII text.

University Microfilms International (UMI) offers links between bibliographic databases and the full text image database on CD-ROM. Periodicals in these databases are scanned cover-to-cover, displaying the images of every page, including the table of contents, photographs, graphics, illustrations and advertisements.

The bibliographic databases are searched on CD-ROM. The screen shows whether the full text of an article is available on CD-ROM. Simply by pressing the Enter key the user is instructed to insert a particular compact disc containing the full text of the article. The copies, printed on a laser printer, are high quality reproduction of the pages.

ADONIS is a CD-ROM document delivery service in which images of pages from journals are made available on CD-ROM to fulfill delivery requests. ADONIS collects royalties on behalf of the publishers. Resolving the copyright issue was, of course, a major reason for publishers to agree to participate in ADONIS. Librarians and journal publishers have had heated discussions throughout the years regarding photocopying in libraries. Publishers were concerned that photocopying had reached such proportions that it was leading to libraries cancelling subscriptions.

## **Document Delivery and Optical Discs**

Document delivery will become increasingly important as libraries become less concerned with library holdings and more with providing access to information. Optical storage and delivery of full-text information is emerging as a technological solution and can be seen as an opportunity for libraries which have started to experiment with such systems. On the other hand, this development is of great concern to publishers who fear for their journal subscriptions.

### **Full Text Document Delivery Experiments**

A variety of projects in document delivery has been carried out in recent years, such as the Library of Congress Pilot Project that stored images of pages on optical discs. Also noteworthy are the automated document delivery system experiments carried out by the National Library of Medicine and the National Agricultural Library, as well as the projects by the Commission of the European Community, such as the APOLLO Project (digital facsimile transmission), the DOCDEL experiments, including work on full-text electronic journals. In the United Kingdom, the BLEND Programme and the Project Quartet explored electronic journals.

### **The Need for Integrated Workstations**

#### **Hybrid systems**

The most persistent complaint regarding CD-ROMs is the proliferation of search software and the need for a common command language. The standards developed by NISO (the National Information Standards Organization of the United States) and ISO (the International Standards Organization) have not been adopted by many organizations.

In the meantime some CD-ROM producers replicate the search languages of online systems. If a user has learned how to search an online system he or she will be able to search the disc and vice versa. In effect, the CD-ROM system becomes an educational tool for learning how to search the online system, at no incremental charge to the library. Furthermore, an integrated (or hybrid) system will allow automatic saving of the search strategy, automatic log-on, and re-executed of the same search strategy on the online system. In such an update search the system will automatically limit the search to information published since the mastering of the last CD-ROM disc.

## **Integrated Workstations**

To optimize the use of microcomputers it is desirable to integrate all information activities in the workstation, from searching to the actual delivery of the document.

Engineering Information (Ei) has developed the software for such an integrated software package and is currently testing it in a variety of libraries. The Ei Reference Desk, operating in the Microsoft Windows environment, provides for CD-ROM browsing and searching, by accessing its current awareness service, called Ei Page One. Searchers also have the ability to capture citations, to review them and to order full-text documents electronically. The software also provides the option of manual document ordering by filling out an electronic order form. The Ei order module provides for automatic dial-up to connect to the Ei Document Delivery Service and to upload the orders for full-text documents. The user can specify shipping and billing information in the customer profile. The documents can be supplied in a variety of ways, by mail, Federal Express, facsimile transmission or as an image file sent directly to the computer through Internet. The Ei Reference Desk provides the integration of bibliographic searching, ordering and receiving of the full-text document.

## **The Future - Multimedia**

Multimedia optical products are upon us. Adding audio, graphics and video to the computer is a logical progression. This development has brought with it the expansion into the home market. Predictions abound that a multi-billion dollar market will develop within a few years.

CD-I (Compact Disc Interactive) is a joint development by Philips and Sony, integrating text, audio, video, and graphics, allowing users to interact with the application. Compact Disc-Read Only Memory Extended Architecture (CD-ROM XA) is also a joint development by Philips, Microsoft and Sony and includes text, graphics, FM-quality audio with a small video window on a standard CD-ROM. CD-ROM XA is particularly useful for interactive training. Digital Video Interactive (DVI) is under development by IBM and Intel with Microsoft, although its initial development had taken place at RCA's David Sarnoff Research Center. DVI allows audio, still images, text, computer graphics and up to 72 minutes of interactive full screen and full-motion video on a single CD-ROM disc. IBM announced that it will be very aggressive in the multimedia market. Over time IBM intends to integrate multimedia capabilities as native functions with the personal computer system.

## Conclusion

Information technology is changing rapidly. The number of database producers and librarians sitting on the sidelines wondering whether CD-ROM will be just a passing fad and whether it will be obsolete in a few years are dwindling. Growth of CD-ROM titles continues unabated and no slowdown is in sight. In part, the growth is due to the ease with which an online file can be converted to a CD-ROM file. Publishers have recognized CD-ROM as an alternative delivery mechanism for information that has already been created in machine-readable format. At this time, most CD-ROMs are replications of online databases, but that is likely to change as new products are being developed.

Despite its success, the CD-ROM technology is still seen by some as an intermediate technology and there is the fear of obsolescence among database producers, vendors and librarians. However that may turn out, the important fact remains that information has been made machine-readable and been organized in a way that will make it retrievable, whatever new information technology comes along. The intellectual effort that has gone into the creation and organization of the information will not be lost.

What is most important, however, is user acceptance of CD-ROM. There is little doubt that CD-ROM has had a positive impact on the library community, although it has added to the workload of librarians. Library patrons are enthusiastic about CD-ROMs. Their use is growing as more people learn about them and new databases become available on CD-ROM. Library patrons make positive comments about CD-ROMs and the availability of such tremendous information resources. They are thankful for saving them time and for making library visits less frustrating.

Local area networks will provide even wider access to CD-ROM databases. The linking of bibliographic data with full-text, and the efforts of libraries to improve document delivery through optical discs, is greatly appreciated by library patrons.

One of the most exciting prospects of the new technology will be the introduction of new information products, whether they be segments of existing databases, combined subsets of different files, full-text products, or multimedia compact disc including sound, images, graphics and motion video. The introduction of multimedia compact discs in the 1990's changes information delivery and learning in a profound way. Publishers have an opportunity to be innovative in the

way they deliver information and librarians and library patrons will benefit from these innovative new information products.

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# CD-ROM AND MULTIMEDIA\* MULTIMEDIA TECHNOLOGIES AND DIGITAL APPLI- CATIONS

By Ching-chih Chen

**Abstract:** The author gives an overview on the CD-ROM technology area with text, picture, sound, and moving image all available in digital form.

Since the introduction of HyperCard<sup>TM</sup>, each year has been considered as one of the most significant years for the development of multimedia technologies. There have been so many significant advances related to various components of multimedia technologies - computer processing, image processing, optical storage technologies (including CD-ROM, analog videodisc, WORM, and erasable), display technologies, digital audio, consumer electronics, telecommunications, scanning, digitized video technologies, desk-top video technology, etc. All have contributed greatly to the development of multimedia applications.

For example, in the optical technology area, there are so many different types of media (Figure 1). They include:

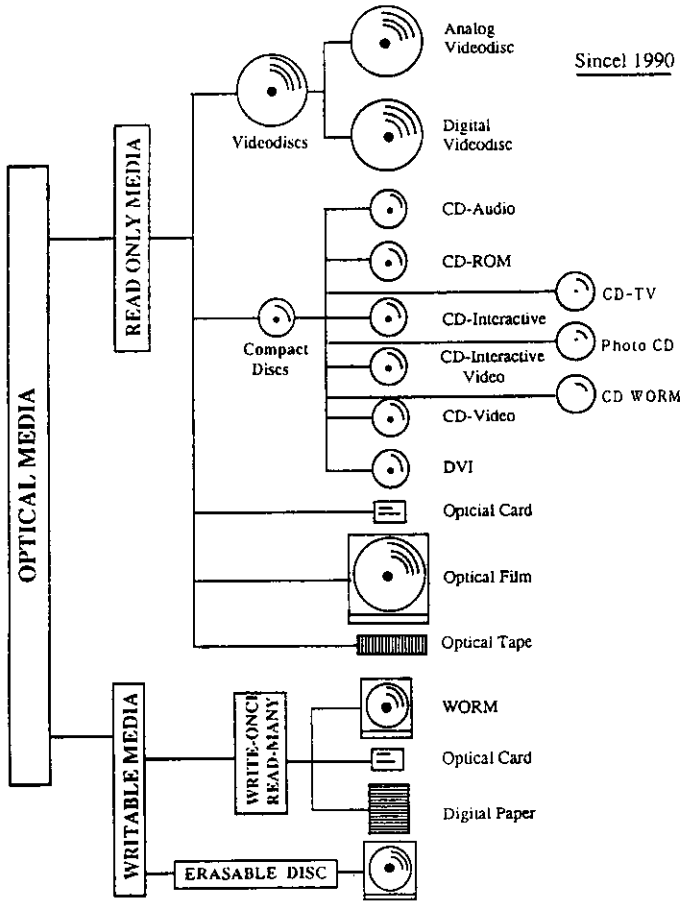
- CD-ROM
- CD-ROM XA (eXtended Architecture)
- CD-I (Compact Disc-Interactive)
- DVI (Digital Video Interactive)
- CD-TV
- Photo CD
- CD-WORM
- Videodisc
- Erasable

While all of them share some common features, such as large storage capacity, quick random access, portability, durability, etc..., they differ from each other as well in functionalities. When integrated with computerized information systems, they can be powerful tools to provide incredibly powerful solutions to information problems. Time does not permit discussion of each of the optical media. Brief

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\* This is taken from Chin-chih Chen, "Understanding multimedia information systems: Consequences for today and possibilities for tomorrow", in Proceedings of NIT '92: The 5th International Conference on New Information Technology. Hong Kong, November 30 - December 2, 1992. pp.49-62.

**Figure 1: Types of Optical Media**



mention to a few of them serves to illustrate the great potential of these technologies.

## **CD-ROM**

In the CD-ROM technology area, the rate of increase in both the number of drives installed and the number of CD-ROM products available continue to grow steadily and fast. The market platform for CD-ROM with an installed base of only 171,000 drives in 1988, has already reached more than 2 million drives now. Many early obstacles to acceptance of CD-ROM technology, such as price, performance of drives, ability to daisy-chain the drives, etc..., have been lifted. Furthermore, the capability to do one's own desk-top CD-ROM publishing is in place, thanks to the powerful but low-cost software and peripherals below the price tag of \$ 1,000, and the low reproductive cost, at \$ 500 for the production of a 600-MB master discs with 10 copies, and each additional for only \$ 1.50. Two students of mine were able to produce a CD-ROM with full-text access to over 2,000 pages of text and over 200 digital images in two months.

## **CD-ROM Jukebox**

Now, high-end CD-ROM jukebox is also available to provide large networked full-image database access. Take the commercially available UMI's ProQuest MultiAccess System as an example, the CD-ROM jukebox is a significant component of an integrated information system. While the jukebox occupies less than 2 square feet of table space, it hold 240 discs with 600-MB of storage capacity for each of the discs. The 240 discs have the capacity to include 1.44 million full-page images. Up to sever such jukeboxes can be daisy-chained together to be connected to a system network, which can then deliver full-text and full-image document delivery over the network to system users in a few seconds.

## **CD-ROM XA, CDI, DVI, Photo CD WORM, etc...**

One step of pushing CD-ROM technology to areas of multimedia is the introduction of CD-ROM Extended Architecture (CD-ROM XA) by Microsoft and Sony in 1989. This standard enables the inclusion of FM video on a standard CD-ROM. More advances also continue with DVI (Digital Video Interactive), CD-ROM XA (etextended Architecture), CD-I (Compact Disc-Interactive), Photo CD, etc... While some are more for meeting wide-scale consumers' needs. such as CD-I and Photo CD products, others are more geared for industrial and academic use, such as DVI.

## CD-I

Compact Disc Interactive (CD-I) is a new consumer multimedia product invented by Philips of the Netherlands and introduced in 1986. CD-I allows audio, video, and graphic materials to be stored simultaneously on the familiar CD format. The CD-I system is capable of handling a large amount of interrelated data in real time. The result is a combination of synchronized audio, video, and text information. The total disc capacity of CD-I is shared between the various types of interrelated audio or video data. A wide range of interactive effects and video images are available, including full motion, full screen video, scrolling and partial updates. For audios, it is possible to store 16 languages on a same disc, although from practical point of view, it is not commonly done.

## DVI

Digital Video Interactive (DVI) technology combines interactivity and high-quality graphics with the presentation of full-color motion digital video, stills, and audio; all in an IBM compatible personal computer. Since Intel shipped its first Pro750™ ADP Application Development Platform in mid 1989, it has been much easier for application developers to create interactive applications with full-screen/full-motion video, multiple-track audio, still video images, and dynamic graphics. Thus, broad and multimedia applications in a variety of markets, particularly in the industrial sector, have been introduced.

## Photo CD

Building on audio CD technology, the Kodak Photo Cd system transfers images captured on exposed and processed 35 mm film onto a writable CD in the process as shown in Figure 2. A dual-purpose photo/audio CD player reads the information, and then displays a photographic appliances, the family TV. Once a roll of exposed film, or a given number of slides and photos have been processed, there are numerous possibilities. Since the images are digitally stored, the digital prints will give finishers the ability to crop and retouch with great ease. Digital imaging also makes it possible to produce easily various products, such as personalized postcards, business cards via desktop PC. Figure 2 is the cover of a Photo-CD of *The First Emperor of China*, produced under my supervision.

## CD-WORM

In the electronic publishing area, aside from the use of CD-ROM as ideal publishing medium as seen from the proliferation of CD-ROM products (over 4000 titles in the current market place) and desktop CD-ROM publishing, it is now possible for us to not only having ROM products in compact discs, but also write on CDs once with the CD-WORM disc by using the CD WORM technology recently introduced in 1991. For the first time, it is possible for us to write about 600 MBs

of information on a CD which costs around \$ 40 with a system configuration around \$ 10,000.



Figure 2. *The First Emperor of China* - Photo-CD

Clearly, we have entered the digital environment, and have witnessed the fading electronic boundaries among text, picture, sound, and moving image, and the coming of multimedia information age.

A few words should be said about information seeking from the users' side. For centuries, we have been conditioned to access information mainly through printed sources. Because non-print information sources could not be readily available to us, we have trained ourselves either not to seek or to offer information available in those formats. Now, with text, picture, sound, and moving image all available in digital form, we clearly see the fading electronic boundaries among them. Once information is being presented in digital format, both the applications developers and users can retrieve the needed information easily, can cut-and-paste as they wish, and can also manipulate it in whatever way they see fit. Taking image as an example, an analog image can only be presented in its entirety as one frame of picture, while a digital image can be stored as a file and retrieved as such as well. Depending on the resolution and scale it is stored in digital format, it presents its

users endless possibilities for processing in any way relevant to the users' need, such as zoom in, zoom out, flipping horizontally or vertically, "fat-bit" in looking at each individual pixel, etc...

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# **COPYRIGHT ISSUES RELATED TO ELECTRONIC MEDIA**

**By Graham P. Cornish**

**Abstract:** Almost any work which represents original thought or creativity is protected by copyright in the majority of countries throughout the world. Works and their carriers can both be protected. The term of protection is linked to the author's death or date of publication. Materials in electronic form pose particular problems in this area as identifying an author is often difficult and date of publication even harder to define, especially as electronic works may change almost daily. This raises the question of when a new work created. A similar problem is faced with the definition of "published". As multimedia works often come from many different sources it is often impossible to identify who owns the rights in a work. Creating a disk raises many problems. Material cannot be included without permission and works in audio or video format will also contain material with performance rights as well as simple copyright. Protecting electronic materials is not easy but the European Union has funded Project CITED which can monitor and authorise copying or use under given circumstances and collect royalties as well as inhibit access to unauthorised persons. This system is not a specific one but sets out a model and standards to be followed throughout the electronic and multimedia industry.

## **Introduction**

Although the theme of the workshop is "CD-ROM issues" this paper will look at electronic media in general as the capabilities of disks to store and transmit images, sound and moving images will be just as important as conventional text in the new information environment. Although copyright may be seen by many as a rather dull and timesome subject, it is, as I hope this paper demonstrates, central to the development of CD-ROM and other electronic products.

## **What is protected**

All works which are protected by copyright enjoy a double protection. The content of the work is protected but so is the way in which it is expressed. The author of a poem enjoys the protection of the poem itself and the publisher enjoys the protec-

tion of the typography used to print the poem. Not everything can be protected and levels of protection vary from one country to another. For example, a name and address are not usually copyright but a list of names and addresses may be, depending on the skill and originality used in compiling the list. This is based on the philosophy that facts are not protected, only the expression of those facts. All these basic elements are essential to understand some of the problems faced by producers and users of electronic media.

In the electronic environment the text of a document or images of a graphic are protected just as if they were in paper format. At least, that is the theory but in some countries it is still not clear that this is the case. In the USA, the EC and most industrialised nations this is true but the legislation in many other countries is rather ambiguous. So an image on paper in these countries is certainly protected but the same image on the screen may not be. The reason is quite simply that much legislation was passed before the electronic era and the law has simply never caught up with the technology. It is only in the last few years that computer programs have definitely been protected in some regimes as they were not evident to the naked eye and therefore, it was claimed, could not be expressions of anything! If electronic format do not qualify for protection then it is virtually impossible to protect the content as that content needs some protectable expression.

So, to determine whether an electronic work is protected or not it is necessary to decide whether the content is capable of protection and then whether the law allows protection of the expression. It is important to note these are not progressive questions. The content may not be eligible for protection but the expression may be. For example, if the text is a play by William Shakespeare it will not be protected but the electronic format of the same text will be, because the publisher will have the right in the electronic disk but not in William Shakespeare's play.

### Length of protection

Copyright rarely lasts for ever but the rules for how long it does last vary from one country to another. Even within the EC at the moment duration can vary from 50 to 70 years *post mortem auctoris* for a literary work and variance can be even greater for photographs. Harmonisation of these rules is in progress but in other countries there is just as much variety. In some countries a photograph is protected for only 25 years which can have serious implications for databases containing photographic images which may well qualify for this short period, compared with the 50 years *post mortem auctoris* which may apply to the rest of the text. If the work is truly multimedia and contains elements of sound as well then a whole new range of problems arises. Assume that a multimedia disk con-

tains a piece of music which is sung. Then there will be separate copyrights in the lyrics, the performance of the words (the singing) the music, the performance of the music and the disk on which it has all been recorded. This is in addition to any accompanying text or illustrations. These can all have different terms of protection.

One of the greatest problems, especially for database producers, is just how long copyright really does last. Where a work has an author the rules of duration are usually linked to the death of the author but for an anonymous work (or work by a "legal person") duration is often fixed according to the date of publication or creation. In an electronic mode, what does "publication" mean? How do you know when a database goes out of copyright? It is continuously being updated, changed, enriched and perhaps having deletions made. At what point should it be decided that a database goes out of copyright? What constitutes a new database to begin a new copyright term? Although these questions may seem academic at the moment the time is rapidly approaching when they will become commercially important as data begins to reach the end of its protected life.

### **Ownership**

Not only does copyright last for different periods of time but it is owned different people. The different rights just mentioned can be owned by as many different people as there are elements in those rights. Writers, composers, authors, photographers, singers and musicians can all enjoy protection of their element on the disk. It is not easy, therefore, to find out just who can give the owner of the disk permission to do what. Ownership may be the property of individuals, institutions, publishers, agents, orchestras or executors for heirs and descendants.

### **Preparing a disk**

In order to prepare an electronic work for publication/distribution, the potential publisher must make sure that the material to be used is either not copyright or the publisher owns the copyright either by negotiation or became the content has been created by the publisher or someone contracted by him to undertake this. Once it is clear that the material can be used legitimately then the publisher must be certain that the work which is going to be produced can also be protected by copyright. There is little point in investing money in an expensive database if it cannot be protected and is quickly exploited in competition with the original owner. "Nobody but a fool ever wrote, except for money," said James Boswell.

## Using a disk

Users are notorious for claiming to be ignorant of copyright law. This is usually an excuse so that they can do whatever they like with a work with a clear conscience. However, there are two elements to consider when proposing to use the data stored in electronic form. Firstly, unlike books and journals, many electronic documents cannot be accessed unless the intending user has signed a contract with the publisher. Online databases can only be used after such a contract has resulted in the issue of the necessary password. Many CD-ROM products are sold with strict contractual limits on who may use them and how often and in which locations. Therefore many of the problems faced by those wanting to make use of information in electronic form are related to the contract with the owner rather than copyright law generally. Where copyright does apply, the restrictions on using electronic information may well be more strict than for the equivalent paper formats. This is because materials in electronic formats are more vulnerable and so more carefully protected. So, in the UK, for example, it is an infringement of copyright to make and store an electronic copy of a work even if the copy is transient or incidental to some other use of the work, even if that use was legitimate.

## Protection

It is all very well the law stating what can and cannot be done with a copyright work but how can this be enforced? In the case of photocopying this problem has always been impossible to solve. Except in rare circumstances where people have been actually caught making multiple copies, any illegal photocopying goes undetected. In the electronic environment the stakes are higher and so the need for protection is greater. Contracts form one basis for this; restricted access to online databases using passwords and codes is another. But publishers are less anxious about preventing access and use than allowing it under controlled conditions. After all, publishers publish which means making works available to the public so anything which achieves this for them, provided that the economic conditions are right, is probably to be welcomed. Increasingly publishers now see libraries as an element of the publishing chain. After all, libraries reach parts of the market that a publisher cannot reach directly. Therefore wider access can be achieved but naturally in return for some economic benefit for the copyright owner, usually the publisher. In addition publisher also want to be able to monitor the way their works are used. Some kind of system needs to be developed to allow all these things to happen - permit access, monitor use, limit unauthorised use and arrange payment when necessary.

An EC-sponsored project has shown that all this is now possible through the development of a generic model of copyright protection of digital information (the CITED model) together with corresponding guidelines and toolkit to enable the model to be implemented in specified domains. The generic nature of the CITED model means that it can be relatively easily mapped on to the legal background both as it is currently and within its foreseen developments. The generic model is also capable of being used as a standard against which different systems can be tested to ensure that they confirm to the basic requirements of a CITED protected system. Compliance with the model CITED can be established for a range of standards, and via a number of different technical strategies. The level of protection can be defined, depending on the nature of the information to be protected, and the rights of various CITED users can be specified. These rights are specific to the users, but the effective right to gain to a particular piece of information will, in practice, depend on the protection level of that information. At the technical level the CITED model is primarily concerned with the relationship between "actions" (ie. those actions which users may wish to undertake), and "rights" (ie. those legal rights which owners, distributors and end-users enjoy). The CITED model is concerned to capture on record the "actions" and the response to these actions will depend on the rights which users of the appropriate information have acquired by purchase or agreement. Although the primary method of acquiring rights is to purchase these, there is no reason why a CITED facility should not permit free access if the owner so wishes. What CITED would permit is the monitoring of the free use which would in itself be a valuable piece of data. Naturally a critical area is the detection of actions which are not permitted, either generally or to a particular user. Of course, CITED can be used both as a countermeasure to such threats and as a marketing tool. Attempts at unauthorised use may bring not just a negative response but information as to how the action which has been refused could be executed. The CITED environment is therefore dynamic and can respond to a range of possibilities.

Naturally some of the technical tools used in the CITED project are adopted from the repertoire developed for the security industry. However, within the CITED project these are viewed as placing a protective guard around the copyright information in a manner which, while preventing unauthorised copying, nevertheless permits convenient access for authorised use. In fact CITED is a sort of tool kit which provides a variety of implements which may be needed in some, but not all, environments.



## **Conclusion**

Copyright is a right which needs to be respected and understood. Like all rights it has limitations. It can be a real benefit to the information community as a stimulus for creativity but over-restriction can also cause loss of access and availability. Eventually much copyright law will turn into contract law in the electronic field which will make market forces rather than law the key to achieving maximum exposure of information.

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# **CD-ROM STANDARDS ISSUES: INTERNATIONAL CD-ROM STANDARDS: CREATION AND MAINTENANCE**

**By Marjorie M.K. Hlava and Edward Greenrich**

**Abstract:** This paper reviews what standards are in place for, or in use with, Compact Disc Read Only Memory (CD-ROM). It suggests areas of change and/or refinement to these standards. The paper describes the activity or process governed by each standard, its advantages and drawbacks and the implications or relevance of its use. Also, it addresses the requirements for maintenance of the existing, and creation of new, CD-ROM standards. These include hardware, software, and firmware issues.

## **1. Introduction**

Many CD-ROM users, developers, and producers consider that the compact disc standards in place are behind the times, especially with regard to interface specifications. The standards are clearly in transition with emerging technologies setting new benchmarks regularly. These demands come from not only CD-ROM XA (extended architecture), but also from CD-I (intercative), CD-Audia, DVI (digital video interactive), among others, as multimedia continue to make advancements.

The CD-ROM industry needs standards that promote incorporation of technological advancements, quicker access, are easier to update, and move across platforms from UNIX to DOS to Windows to Mac, etc. To accommodate accelerating demands, vendors are providing consumers with state-of-the-art solutions for their multimedia needs in the optical environment. These state-of-the-industry concepts, approaches, and technology must be considered as standards evolve or are further developed. Higher quality and better performance of data in image form is required to fully address this challenge. User defined graphics-related materials need to have better compression techniques, must be carefully scanned (with rigid quality assurance), and perhaps linked to a keyword index to take full advantage of these developing technologies. A lack of image and compression standards hampers implementation of newer technology

## 2. Hardware

The approval of NISO Z39.60 in the mid-1980s created a formal standard that established the volume and file format specifications for optical media of a read-only nature. This standard helped to create a foundation for the integration of CD-ROM into various computer operating systems. It aided the transition from the prototype structures of private firms or industry groups to a broadly accepted standard.

The process of transition from High Sierra Group's "wide-open" standard to Information Standards Organization 9660 is more or less complete. It could be considered wide-open due to the informal manner in which it was created, a meeting of early industry players at a hotel high in California's Sierra Mountains. By comparison, the adoption of ISO 9660 was much more formal although modifications to High Sierra were not all that extensive. The main difference was centered on the inclusion of extended attribute records capability. This helped to open it up to system that did not conform to DOS file parameters. As earlier mentioned, while the transition to a great degree is over, some vendors continue to offer High Sierra Standard and many CD-ROM drives are in place with that standard.

Pressure is always there to retain elements of older technology via standards. This collides with the countervailing pressure of new techniques and technologies that are attempting to meet the growing demand for better CD-ROM applications. These interests must be fully weighed and the implications considered if the industry is to develop in an orderly fashion. If the various issues are not addresses in a comprehensive manner certain technological inventions or innovations may be delayed, never enter a mainstream market, or sometimes create a new fast-growing area that standards have to race to catch up with it.

Multimedia enhancements are pushing back (and blurring) the boundaries of communication/media types. By adding various multimedia components, CD-ROM products are becoming more responsive and, therefore, appealing to a much broader range of information and entertainment consumers. For example, audio, video and even still images were not associated with textual material on compact disc a few years ago but are increasingly integrated now.

Integration of textual material with graphics, audio, and video has heightened the awareness of end users to the expanding possibilities associated with CD-ROM. The standards must quickly incorporate new developments so as not to impede their introduction or allow de facto standards to remain for extended periods of time.

ISO 9660 covers the physical structure aspects of CD-ROM. That is, it dictates a specific method for writing of data to the CD itself. In addition, the standard contains logical file format specifications. This is a great aid because it allows CD-ROMs to be portable from platform to platform. Depending on the developer or publisher, a disc could be used with DOS, MAC, UNIX, or Windows operating system environments as long as the ISO 9660 criteria are met.

The small computer systems interface (SCSI) is the standard for interchangeable CD-ROM drives between systems and is considered by some in the industry as too broad a standard. This due to the fact that the protocol, although technically SCSI compatible, require different software drivers and are therefore not completely interchangeable.

CD-ROM configurations and interfaces are not standardized, with the exception of working with or within the above mentioned specifications. If you use a number of CD-ROM products, they seldom have the same requirements, whether they are related to a single discipline or for general review and demonstration purposes.

CD-ROM titles arrive usually with a combination of specifications that are not in place on most systems. For example, some common requirements are a high resolution color monitor, a graphics card that is not included with most machines, and a relatively high amount of RAM. In many instances these requirements are not for optimal display but define the minimum operational configuration. ANSI/NISO Z39.72-199x (CD-ROM Standard Format for the Submission of Data for Multimedia CD-ROM Mastering) is under development. The draft version was out in 1992 and is currently being circulated for comment by all interested parties.

### **3. Software**

Each type of software for search and retrieval applications presents the user with a different interface. Even if the basic functions are virtually identical the operational procedures will not be the same. These variables extend to the amount of documentation, type of support, level of ease or difficulty during installation.

Most of the attention and effort has gone into the development of standards for the media and hardware, although this is starting to change. An example of this change in emphasis is ANSI/NISO Z39.73-199x (CD-ROM Standard Interface Retrieval Protocol) is in development with a chair appointed in 1991 and a draft still in production.

#### 4. Text Input Standards

The character set that is standard for full-text data is the American Standard Code for Information Interchange (ASCII). No data conversion work is required when using ASCII as opposed to the EBCDIC character set. Nor is special display or print related hardware is needed for normal output.

The development of standard formats has aided the interchange of data from different information sets or types. The Z39.2 standard provides data interchange of bibliographic text using a Machine Aided record cataloging (MARC) record structure. This standard is maintained by the MARBI Committee of American Library Association.

Tagging of text permits the attachment of value and /or description and is a way to identify a specific data element. The process of tagging allows for quicker location and manipulation of a particular section of data in a database. Advantages include faster search and retrieval (by creating inverted indices), merging of data, or as a processing aid in creation of a print product.

Tagging text in a very structured manner facilitates its use in different compact disc environments. Structured tagging allows the text to produce any number of electronic or print products. It allows fast creation of output from databases in addition to aiding end users to perform searches of flat files, relational, or object oriented databases.

Because of the need for multiple output formats, non-standard custom formats abound, although a number of adaptable standardized tagging schemes have been developed over the years. The standardized schemes vary in complexity, flexibility, acceptance, and expansion capability or a combination of these factors.

SGML is becoming more popular due to the fact that it addresses these aforementioned factors. The various MARC formats (such as LC-, US-, UK-, FINN-), left-tagged, and comma-delimited formats are among the other options.

Some years ago the United States Department of Defense mandated standards via Computer-aided Acquisition and Logistic Support (CALs). One facet of the CALs' initiative is Standard Generalized Markup Language (SGML) MIL SPEC M-28001 A under ISO 8879, a scheme that marks each data element as a distinct entity, including type style and size, thereby preserving it for future applications. Z39.59-1988 provides an application of SGML by specifying the syntax of generic tags and predefined tags for the most common manuscript elements. Z39.59-1988 is currently under a five year review and will be withdrawn and replaced by ISO 12083.

The decision to use SGML as a tool to enhance CD-ROM databases will make this technology a much stronger player in the publishing arena. The addition of SGML to a CD-ROM database will increase its appeal as publishing device. Creation of a Document Type Definition (DTD) and implementation can be time consuming and costly. A cost/benefit analysis should be considered before committing to this additional enhancement work. Standards that were initially developed for the publishing industry have cleared the way for the creation of software to manipulate text for different applications. Software is available with the capability of holding the information in a manner that allows for searching of flat files or in a relational mode, but also will maintain the data with print attributes for publishing activities.

Publishing activities may include generation of proprietary documentation and manuals for inhouse consumption or camera-ready copy for commercial book publishing ventures. With a compatible printer configuration the equivalent of chapters, complete documents, or entire books can be generated from the disc with output that contains actual publishing characteristics such as special symbols, bolding, underlines, variable types sizes and styles (Italics, Times Roman), etc.

Considering the information needs of your organization along with the amount of effort required to implement a set of standards may or may not simplify the CD-ROM implementation task. Choosing the most appropriate path by linking these various options together is the difficult part in producing a high quality CD-ROM product.

## **5. Images**

User defined graphics-related materials (line art, bar charts, half-tones, graphs, etc.) add a new dimension to databses that previously contained only textual information. Databases have been further enriched by including very high resolution images with greyscale or color up to 256 levels. These images will provide a much clearer and stronger presentation of the information on the CD.

Standards beyond bit structure and compression specifications need to be put in place to insure high quality output to an image form. Imaging provides a relatively inexpensive way to capture graphics or even pages of text into bit-mapped format. However, if the scanning process is not handled properly the images may be of little or no use. Depending on the application, degradation or corruption of the images vis-a-vis the source documents may render the output worthless. Output with data that is missing or difficult to read will quickly turn off a prospective end user.

Image formats such as TIFF, PCX, and DIF have become de facto standards within the industry. Software developers have chosen to support one or two of these "standards". A number of CD-ROM developers support the most popular compression algorithm standards which are those set by the Consultative Committee for International Telephony and Telegraphy (CCITT). Monochrome and greyscale images are easily handled by CCITT Group III and IV. These may sound familiar because they are in use as fax transmission standards.

To avoid problems with color photographs a different type of compression - JPEG is recommended. This standard was developed by the Joint Photographic Experts Group of ANSI and is the most commonly used compression for these applications because it accomodates continuous tone still images that are very dense. The Association for Information and Image Management (AIMM) has begun standards development on File Format for Storage and Exchange of Continuous Tone Images. It will address the header information required to exchange bi-level JBIG and greyscale JPEG images.

## **6. Audio/Video**

The Motion Picture Experts Group has set a standard (MPEG) that includes audio and video routines for CD-ROM. Developers are using this standard for their upcoming products. As an example, NIMBUS Information recently completed development on its CD video technology. Nimbus used a C-Cube MPEG-1 chip for its converter that decodes the compressed video and audio signals.

## **7. Performance**

The introduction of compression (encoding) and decompression techniques have improved compact disc performance. Retrieval time declines while storage capability is increased.

For instance, CD-ROM Inc. recently announced the release of a driver that compresses and writes data to CD and is able to access it from there. The greatest impact of these software algorithms and firmware/hardware designs has been on bit-mapped image storage, especially when a grar number of images are involved and/or where the resolution and levels of color or greyscale are very high.

The value of images on CD-ROM can be enhanced by the addition of an index file. This provides a more accurate portrait of the database and the information available to each searcher. It further assists the user by limiting the amount of effort required to find more relevant information.

Creation and linkage of an ASCII keyword index to an image database will decrease search and retrieval time by allowing users to access the ASCII file to locate probable hits. Adding or updating a keyword index to a textual database is a way to add value to the information. NISO Z39.19-199x would be applicable for developing a thesaurus needed to implement a system to generate key word index terms.

Editorial enhancements are accomplished through the use of editorial staff, automated routines (machine aided indexing) or a combination of the two. Crucial factors to be considered are time, uniqueness of the data, and budgetary constraints.

Use of index files reduces the number of instances users must open the relatively bulky (large amount of bytes per file) images. (If it can not be used effectively and efficiently it will not be used or recommended.) Information that is hard to access, or "get at", will not be utilized to its full potential.

Performance (increased speed of retrieval) via encoding standards has not had a great impact on textual collections, with the possible exception of very large full-text databases. A number of other techniques probably have had a greater impact on textual information.

Better data organization and layout along with keyword indexing and tagging methodologies such as hyperlinks and hotlinks promise to further enhance search and retrieval performance. Ways to improve or enhance the ability to locate non-textual material on CD is currently under consideration. This probably indicates that indexing of video files is on the horizon.

## **8. Media/Data Delivery**

Delivery of data (text, graphics, audio, video, and film) on a single standard from the media types available for premastering and mastering activities would represent another step forward in the CD processing arena. Media such as Exabyte- or 4mm RDAT are likely candidates. The MPEG standard addresses DATs and nine-track, among others. These newer technologies will move the industry toward a more economical and reasonable medium of storage and transfer.

## **9. Text Integrity Standards**

Accuracy of textual material on CD should be addressed. Much search time will be wasted (with fewer hits generated) if the data is below a certain level of accuracy. Documents in poor condition generally lead to images of diminished quality that then produce OCR output with a low level (approximately 99.0% or less) of



format and content accuracy. Low accuracy levels translate into large amounts of programming and editorial time to clean up the data.

If data titles need to be at what is considered the information industry's unofficial standard of 99.9% (five errors per 10,000 ASCII characters) the amount of time and money expended for clean-up would outweigh the higher up front charge for keyboarding. Careful analysis of each project and its unique documents, output format, time frame, and required accuracy level should be taken into account before the method of text capture is chosen.

Ultimately, an typographic accuracy standard for text presentation will produce higher quality databases regardless of whether they are full-text, fielded, image only, or multimedia.

### **10. Maintenance of Standards**

The various agencies and standards bodies provide maintenance for each standard that has been developed. These include but are not limited to NISO, AIIM, ISO, ANSI, and X3. A request may be made to revise a specific standard. It is then commented on or circulated for comment and is voted upon by that respective body. A draft is generated and regenerated until all negatives and comments are resolved. The draft is revised and voted on for final approval. These activities can include the withdrawal of a standard. A standard is automatically revised, reaffirmed or withdrawn every five years.

Prompt updating of standards is essential to reaching the full potential implementation of these numerous technologies and procedures. This allows developers to offer a more complete service area via text, graphics, video, audio, etc. while taking advantage of the great storage capabilities associated with CD-ROM technology.

### **11. Creation of New Standards**

Standards are written with the end user taken into account. To create a new standard NISO for example has a Standards development Committee that oversees the standards development process. 1) Each project to be submitted should have a descriptive title. 2) The proposer (individual or organization) should include address, telephone, facsimile, e-mail address, organizational affiliation. 3) The data of project submission. 4) Justify the proposed project. This may be accomplished by identifying the need for the project and the problems that it is intended to address. Who would be interested or care about this subject? 5) Describe the scope and application of the proposed standard. Include an estimate of the amount

of resources needed such as time, money, and skill or talent to develop the proposal into an American National Standard. 6) Examine the implication on users moving to the new standard. 7) If available, attach draft document on which the standard can be based. 8) Identify closely related standards activities. 9) Include which NISO or other organizations should serve on the committee. 10) What type of funding might be available for the project. After a standard has reached consensus in one country it is brought forward for international consideration.

Designing a standard for is an area that will help end users. This could be done by establishing a protocol that would include interface and field tag specifications. A set structure for database files will allow users to become accustomed to seeing certain data types such as author, title, date, keywords and so on in standard placement. This will allow end users to more readily get "up to speed" when accessing a new or seldom used database. Among the other topics that might be considered for standards work are file design, accuracy, device driver, interface, authoring, hypertext, hot link, and network standards.

## **12. Conclusion**

Standards development helps resolve the issues in any area. Consensus on techniques and procedures have helped to push the quality of CD-ROM databases to a higher level. They have increased this medium's value by reducing the cost for access to large amounts of data while generally improving the search and retrieval response time. Standards have helped further the integration of CDs into the mainstream of information tools by aiding entrance to a large installed user base.

These preparation activities have elevated the medium by effecting a more concise, comprehensive, and pleasant presentation of computerized information collections. As this segment of the information industry grows, it may be assumed that further progress will be made in the development of tools and techniques that will drastically enhance performance and data capacity per disc. At the same time, the cost for capture and manipulation will probably level off or decrease.

This trend toward better performance and more information per disc will no doubt spur greater acceptance among current end users of database products and bring additional users from the public at large. Also, it should accelerate the movement towards more open standards that are broader, more flexible, and more encompassing to accommodate these new technologies.

Interested persons are invited and strongly encouraged to participate in the standards development process. Working with standard groups such as ISO, NISO

(Z39), AIM (MS) and CBEMA (X3) will enable better procedures and products to reach consumers in less time.

The issues will continue to be resolved and aided by a responsive standards process.

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# TWO CD-ROM PRICING ISSUES

By Michael E.D. Koenig

**Abstract:** Two major pricing issues related to CD-ROMs are discussed: lapsing ownership and metered pricing. Lapsing ownership is a real concern to librarians, and it does not really benefit the producers, rather it creates customer ill-will. Producers have adequate alternative protection, and libraries should make their opposition known. Metered pricing for CD-ROMs is a phenomenon that will happen in some cases, but the author feels that it is not likely to have a major input in the library field.

## 1. Introduction

There are a number of issues affecting the pricing of CD-ROM technologies, but two of them are both contentious and could potentially have a serious impact upon the field. Their resolution at the moment is not clear. Since CD-ROM technology holds great potential for library service, and it is particularly attractive in the context of the less well developed countries (Beaumont & Balson 1988; Brito 1989), it is therefore important that the field address these potential issues early on. The two concerns are lapsing ownership and metered pricing.

## 2. Lapsing ownership

The more widely articulated of these two concerns, at least for the moment, is the concern that might best be described as lapsing ownership - a phase that this author has not seen in the literature but one that is brief and descriptive. The concern is that CD-ROMs are typically leased for a fixed period of time rather than purchased outright, and if the lease is not renewed, the typical lease requires that no further use be made of the product. This is in market contrast to the purchase of traditional print-on-paper information where one essentially acquires perpetual ownership, through of course subject to copyright laws and concomitant restrictions on copying or duplicating. The buyer is required to pay no annual fee to use the material, no matter where it is purchased, and there is no obligation to

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return the back issues if the buyer decides to cancel the subscription, nor is there any prohibition of resale.

Most CD-ROM products, by contrast, are set up as subscription services with regular updates and annual fees. The vast majority of these subscription type CD ROM agreements include phraseology which prohibits any use of the product, including old discs, after the subscription has expired. Most agreements also require the subscriber to return or destroy all copies of the compact discs and the software upon termination of the agreement or lease. These requirements have been a matter of great concern to librarians (Jensen 1991). Most librarians would admit that the situation seldom arises in which lapsing ownership is in fact a problem, but even so the principle bothers them. Most librarians see themselves as deploying their resources to build a permanent collection, not simply deploying resources now to provide services now or in the very near future. The latter concept is taken for granted in the corporate library and information world but it is generally alien to librarians from the not-for-profit community.

It is interesting to note that this desire to shift the method of acquisition of library reference tools from straight purchase to a lease with lapsing ownership is not novel with CD-ROMs, or even new with electronic delivery of information, but rather it began as far back as microform technology. For example, the Chemical Abstracts Service (CAS) of the American Chemical Society, which has always sold its print services as straight purchase, chose to lease its microform version of the Chemical Abstracts database with the stipulation that if the lease was cancelled, all previously acquired material became the property of CAS and was to be returned. The author knows of several cases where a library did in fact subscribe for a period and then cancel its subscription (usually because the microfilm version had been seen 'bought' to provide better simultaneous access to the database and relieve congestion at the printed Chemical Abstracts, only to find that the users avoided the cumbersome microfilm version; if they found the print version too occupied, they simply left and returned later rather than use the microfilm). In none of these cases did the library in fact return the microfilm to CAS, nor did CAS ever ask for it.

The use of CAS microform policy is an illuminating example. CAS admits that the policy created customer ill-will. This policy was nominally maintained, if not enforced, from the early 1960s until quite recently. Apparently the policy was created because CAS felt that while the copyright law was adequate to protect them from wholesale copying of the print product, they needed additional protection for the microform product. The reason given to the customers for adopting the policy was as a protection against the user subscribing for a year, copying the

database and then not resubscribing. The policy was abandoned recently because it was clear that if someone were to copy the database, it would be from an electronic version - online or CD-ROM - and not from the microform version, and that the only contribution the stipulation was now making was to annoy customers.

Clearly, CAS would have been better served by a straightforward stipulation in the lease agreement that the database not be copied. The issues are essentially the same for CD-ROM databases. The database owners would be better served by a signed agreement as part of the lease that the database not be copied. The database creator does have a legitimate concern that last year's copy not substitute for what would have been a second sale, but that is typically not an item of contention; the user does not object to returning the old CD-ROM after the new one has arrived, but rather to the lapsing of ownership if the subscription is cancelled. The database creator does have another legitimate concern that a database user not merely subscribe occasionally - for example, only on alternate years. That concern could be addressed by vesting: that is, a clause that the user's ownership rights are vested after (i.e. do not commence until) a certain number of years, perhaps three years, has passed. Thus, if a library, cancelled after having subscribed for three or more years, it could retain the database, subject of course to the other clauses of the lease which stipulate that it not copy the database.

There is certainly evidence that liberal policies do not harm the publisher. The H.W. Wilson Company, for example, not only does not insist on lapsing ownership, but it also lets customers keep their old discs. Wilson has concluded that this has not injured it in any fashion, and this policy has certainly earned it kudos and renewed loyalty among customers who had grown somewhat disaffected at their slowness in automating.

Librarians should at the same time realise that a 'standard' contract is often negotiable. If a library is concerned about losing ownership, it can strike out the offending line in the lease and substitute something else, perhaps vesting ownership and a commitment not to copy. Database creators are far more flexible in these matters than they would have customers believe. It is much simpler for the database creator or vendor if everyone agrees to their standard contract, but a reasonable modification will often be accepted rather than forego a sale. Librarians and information officers should not be reluctant to request changes. They have nothing to lose and everything to gain.

The concern of lapsing ownership is to a large extent something which should ultimately not remain a major issue. At base is the reality that most of the CD ROM products for which librarians are concerned about lapsing ownership are, at

this point at least, products for which the half-line of information is relatively brief, and consequently old discs and the information on them is not likely to be of great value.

For the distributors or producers to insist that ownership of the discs lapses if the subscription is not maintained is, in most cases, pointless; benefiting the producer nothing, unlikely to be enforced and creating only ill-will. The producer can be quite adequately protected by all of the other constraints against resale, copying, etc. contained in a typical lease.

### **3. Will there soon be a meter running?**

Probably the aspect of CD ROM that the library community finds most attractive is that the meter is not running when the user searches; that is, CD-ROMs are priced on the basis of a known and predictable annual fee schedule that is independent of the amount of usage. This makes the system much less threatening to the user, and even if the search software is precisely the same as the online version, the CD-ROM version is thereby in reality much more userfriendly. From the librarian's selfish point of view, however, the user-friendliness of CD-ROMs resides in how much easier it is to budget for CD-ROM than it is for online and how much easier it is to gain approval for the predictable budgetary expenses of CD-ROM that are guaranteed to contain no nasty surprises. This is in sharp contrast to the paradox of online databases, where the more popular a product proves to be, the more difficult, complex and painful the library's budgeting and political maneuvering are apt to become.

From this viewpoint, a serious concern is the possibility that CD-ROMs can easily be made to behave like online databases and meter the behavior of institutions, departments or individuals for subsequent billing. A metering system can easily be built into a CD-ROM and the meter monitored when the old CD-ROM is returned, or in some cases the meter could be queried remotely. Some persons in the information industry have argued that the development and application of this capability is vital to the growth of the CD-ROM industry (Shear 1992). This prospect sends a chill down the spine of most librarians.

How likely is this scenario? The bad news is that this capability is being developed and will almost certainly be used. At least two companies, National Semiconductor Corporation and Wave Systems Corporation (formerly Cryptologics International Inc.), have recently publicly or semi-publicly announced such systems. The Wave system is in beta test (Clark & Siegmann 1992) and Wave has stated that 'commercial introduction of the Wave System is planned for early 1994' (Wave Systems Corporation 1993). Wave Systems has li-

censed National Semiconductor Corporation to manufacture the metering chip. Interestingly, National Semiconductor is promoting a system, presumably the same, as Opener, and is soliciting business from information publishers. It is promising that 'a substantial number of partners will be with us at a formal announcement of the technology in early 1994' (National Semiconductor Corporation 1993).

The good news is that metering will by no means be universal, and that it may to some degree be an interim technology. There is no question that there are sensitive high value information applications for which the database creator legitimately desires such a degree of control. Typically, however, these are applications (for example, sensitive market analyses) for which there is a great deal of time sensitivity and for which the logical host would be an online system. The logical future for such data is online systems utilizing public key encryption. The union of networks, for example the Internet, with such encryption technology is a very complex issue whose resolutions will take time, however. Part of the problem is the loose and relatively unstructured governance of the Internet and its tradition of open access, and another major part of the problem is the concern of governmental agencies about the use of encryption and the impact of that encryption upon the ability of national security administration to monitor communications. Needless to say, this becomes a complex issue of transborder dataflow and the complexity probably means that no resolution is imminent.

In the meantime, the use of CD-ROMs with metering, probably including less sophisticated encryption of those meters, will provide a viable alternative with an acceptable (if not quite so adequate) degree of control. The librarians most likely to be affected by those developments are corporate librarians, the typical users of that sort of sensitive data. Public, school and academic librarians are likely to be relatively unaffected.

Most vendors are now aware of how attractive the 'all you can eat for a fixed price' method of pricing is to the community of library users (Erkkila 1991). To illustrate that advantage, let us imagine a scenario in which the librarian has two choices:

- 1) Provide access to a database on a metered basis. The librarian's estimate (and let us assume that this is fairly accurate and reliable, and that the librarian knows it) is that there is:
  - a 40% probability that the year's use will be \$ 7000;
  - a 40% probability that the year's use will be \$ 10 000;



- a 20% probability that the year's use will be \$ 15 000.
- 2) A fixed price of \$ 10 000 for the year, regardless of usage.

In the first case, the best estimate - the 'expected value' of the price to be paid to the vendor - is:

$$\begin{array}{r}
 40\% \times \$ 7\,000 = \$ 2\,800 \\
 40\% \times \$ 10\,000 = \$ 4\,000 \\
 20\% \times \$ 15\,000 = \underline{\$ 3\,000} \\
 \qquad \qquad \qquad \$ 9\,800
 \end{array}$$

In the second case, the price is a simple fixed \$ 10 000.

Let us also assume that the amount that the librarian can succeed in putting in the budget is \$ 10 000.

The vendor would clearly prefer the latter case (on average the vendor will receive \$ 200 more per customer) and the typical librarian would probably prefer it as well, as the expected saving (\$ 200) is fairly small while the 20% chance of being well over budget is a major political liability. The vendors are aware that fixed pricing, if instituted and structured carefully, is in their interest. What is necessary to structure fixed pricing carefully is a set of tiers; that is, smaller but fixed prices for smaller institutions and larger but still fixed prices for larger institutions. Indeed, the attractiveness of the fixed price method is sufficiently strong that in the aggregate there will probably be as many online services adopting some version of a fixed price scheme, as for example OCLC has done for some of its services recently, as there are CD-ROM products adopting metered pricing. Many librarians in fact credit CD-ROM with both making vendors aware of the attractiveness of fixed prices and of compelling the online vendors to rethink their pricing practices (Quint 1989).

#### 4. Summary

In summary, there are two contentious issues related to CD-ROM pricing. For both of these issues, lapsing ownership and metered pricing, the issues may loom larger than is warranted, but in both cases it behoves librarians to be aware of the issue and to make their preferences known.

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# **TRENDS IN THE CD-ROM INDUSTRY AND HOW THEY WILL CHANGE THE WORK OF THE INFORMATION PROFESSIONAL**

**By Ann Lawes**

**Abstract:** TFPL produces the CD-ROM Directory and has done so since 1986. It is now available in CD-ROM format as well as hard copy. CD-ROM and multimedia titles have more than doubled within the last year and a half. The paper examines this aspect, and looks at subjects, language and price. It then examines the effects on libraries and staff. Department's image has been enhanced, people are interested, attracted, and find CD-ROM user-friendly and quick. They do however need training. Service is improved, but information is not as up-to-date as online. Effects on staff are looked at - how they become involved in CD-ROM, how training programmes are needed, for self and users. We look to the future.

TFPL has been monitoring the CD-ROM industry since 1986 when it produced its first CD-ROM Directory.

A measure of the growth of this industry is that the first directory came in A5 format; numbered 125 pages, 48 titles. The latest edition is A4, 1070 pages, 4731 titles.

It is also available in CD-ROM format - naturally.

Each year we produce a compilation of facts and figures. This is the 1993 version and is available for £25.

## **Figure 1: CD-ROM and multimedia CD titles**

Within a year and a half - 1992 to mid 1993 - the number of titles has more than doubled. The market took off in 1992.

In less than 10 years (7 years) we have gone from almost nothing to 6000 titles.

Growth shows no sign of slowing down. In fact, it is accelerating. The curve is getting steeper and steeper.

## **Figure 2: New CD-ROM & Multimedia CD titles in 1993 Edition**

Of the 3597 disks in the 1993 edition, 42.3% are new. 61% are aimed at our market - the PC market.

## **Table 1: CD-ROM and multimedia CD titles by subject 1992-1993**

General interest titles form a significant percentage. The remainder are aimed at specific, vertical markets. For example, medical, business.

## **Table 2: CD-ROM & multimedia CD titles by language of disc 1992-1993**

English includes American therefore -  
63% of all titles are American which results in a bias to American material.

## **Figure 3: CD-ROM & multimedia CD titles by type 1993**

Bibliographic and full text most important.

Although there are more than ever they make up a smaller percentage of the total (1993 cf 1992) because of the growth in multimedia, images etc.

## **Figure 4: Price range of CD-ROM & multimedia CD titles 1991-1993**

Most come between \$100 and \$500 but the biggest growth is those priced at under \$100 because these are aimed at the consumer market.

So we have an information resource which has grown phenomenally. And we know that libraries are buying them in great quantities.

What effects are they having on libraries and staff?

Are our methods of information provision changing? Improving?

What do users think about it all?

Each library and information service will have its own aims and objectives to meet the needs of its particular clientele.

However it is possible to make some general observations.

### **Status of library**

CD-ROMs are popular with both library staff and users. They've been "a catalyst in the end user revolution and, whatever the future of the technology, they have

ensured that library and information services will never be the same again".  
(Richard Biddiscombe, University of Birmingham).

Many libraries maintain that CD-ROMs have enhanced the status of the department.

Excellent public relations.

Attracts new people as well as regular users of the library.

### **Users**

Users love CD-ROM - it is user friendly.

- speed of retrieval
- variety of search capabilities
- browsing
- print results.

They gain confidence because there is no penalty for inefficient use.

### but

Users refuse to read help screens, are impatient and demanding, won't look at any other information.

Difficult to get younger users to use any printed reference tools.

Need extensive training, for example programmes of individual tuition.  
Considerable library staff time is involved.

### **Service provision**

Makes information more easily accessible to students and employees.

Enrich collections by acquiring quantities of text at increasingly competitive prices.

Faster and more sophisticated searches produce better service.

Can give everyone networked PC access so different kinds of useful information on their desktops.

### but

not as up to date as online.

Reduced use of printed versions leading to cancelled subscriptions.

## **Finances**

The price is known and is independent of search time.

Use of online services reduced.

Where heavily used database is on CD-ROM, use for retrospective searches and do online search for most recent material.

### but

initial and ongoing costs can be heavy - hardware, software, discs and physical installation.

### How to pay?

Grants for start up costs.

Pay by putting own information on CD-ROM and selling.

## **Effects on staff**

CD-ROM has brought about enhanced skills, freed up staff time for value added work, and increased job satisfaction.

How?

Virtually all members of staff in a library become involved in a CD-ROM service to some extent. This means that:

- librarians have to know how to use a lot of different interfaces. Users generally have specialisms and only need to become familiar with one
- reference librarians and non professional staff not previously involved with online become computer literate
- continuous and comprehensive training programmes are essential to keep staff up to date with developments and new products
- helping users with CD-ROM takes longer than print and the librarian becomes more involved in user's research

In other words, the librarian becomes adviser, consultant, trainer.

It is fair to say that CD-ROM has taken libraries by storm. It took 15-20 years before online information pervaded but CD-ROM has only taken 4 years to do much the same thing.

**So what of the future?**

We don't see growth slowing down in the immediate future.

Competition will bring the cost of products down particularly in general interest areas.

As multimedia rises in importance a lot more products will include:

graphics  
sound.

Librarians will need to adjust from the viewpoint that information and text are synonymous. They will need to learn to use these new facilities and develop new techniques to train others to make good use of them.

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Figure 1:

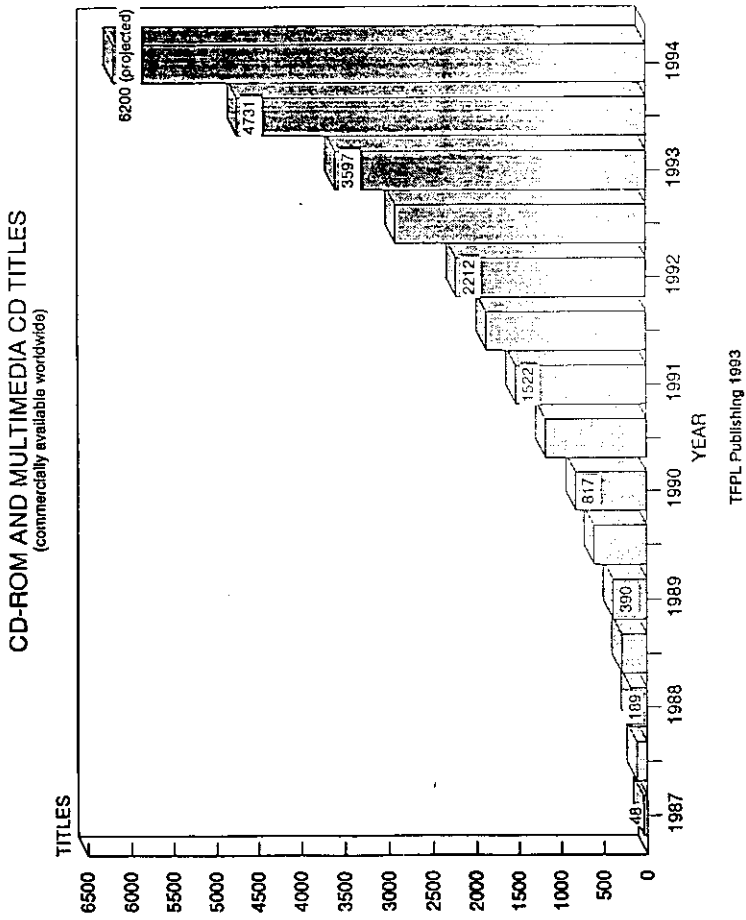
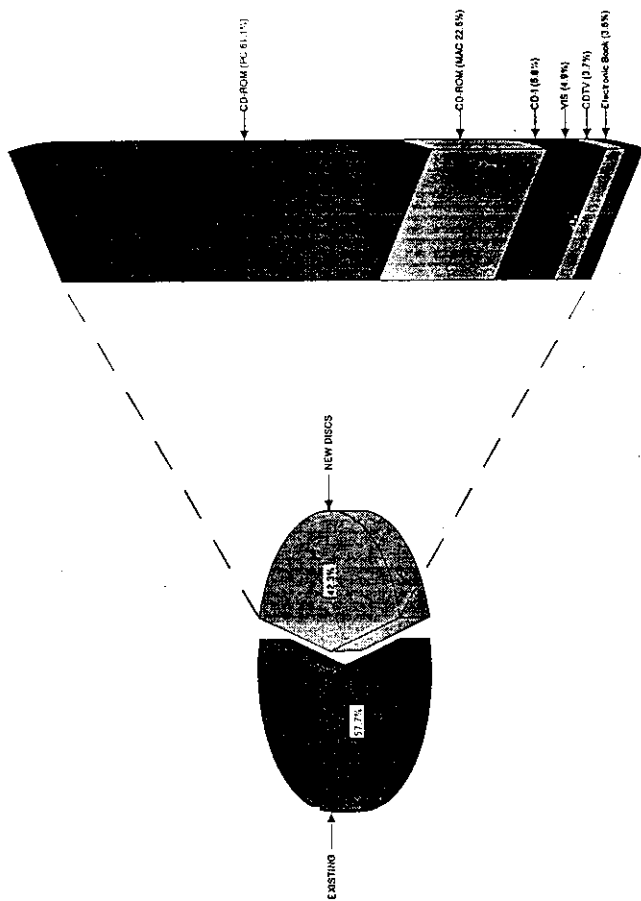




Figure 2:

NEW CD-ROM & MULTIMEDIA CD TITLES IN 1993 EDITION  
(based on a total of 3597 discs)



TFPL Publishing 1993

**Table 1:****CD-ROM AND MULTIMEDIA CD TITLES BY SUBJECT 1992-1993**

Subject Heading	1992		1993		1992-93 Increase (%)
	Number	Percentage	Number	Percentage	
General Interest, Leisure & Recreation	345	15.8	800	18.7	74
Arts & Humanities	227	10.3	447	12.4	97
Computers & Computer Programs	215	9.7	345	9.6	60
Medicine, Health & Nursing	197	8.9	252	7.0	28
Science & Technology	185	8.4	280	7.8	51
Business & Company Information	177	8.0	285	7.4	50
Advertising, Design & Marketing	188	7.5	280	7.8	69
Banking, Finance & Economics	165	7.5	249	6.9	51
Education, Training & Careers	165	7.5	424	11.8	160
Crime, Law & Legislation	163	7.4	297	8.3	62
Government Information & Census Data	155	7.0	268	7.4	72
Maps, Map Data & Geography	155	7.0	282	7.3	69
Libraries & Information Science	148	6.7	194	5.4	31
Earth Sciences	145	6.5	188	5.2	30
Chemicals, Drugs & Pharmaceuticals	125	5.7	185	4.8	32
News, Media & Publishing	117	5.3	171	4.8	48
Languages & Linguistics	110	5.0	258	7.2	135
Social & Political Sciences	89	4.0	157	4.7	78
Directories	80	3.8	106	2.9	33
Transport & Transportation Systems	73	3.3	188	4.7	130
Life Sciences	72	3.2	148	4.1	103
Agriculture & Fisheries	62	2.8	96	2.7	55
Military Information & Weapons	47	2.1	71	2.0	51
Architecture, Construction & Housing	39	1.8	88	2.4	121
Intellectual Property	35	1.6	48	1.3	31

Total titles in 1992 = 2212

Total titles in 1993 = 3587

Totals above sum to greater than 100% due to discs covering more than one subject area

TFPL Publishing 1993

Table 2:

CD-ROM & MULTIMEDIA CD TITLES BY LANGUAGE OF DISC 1992-1993

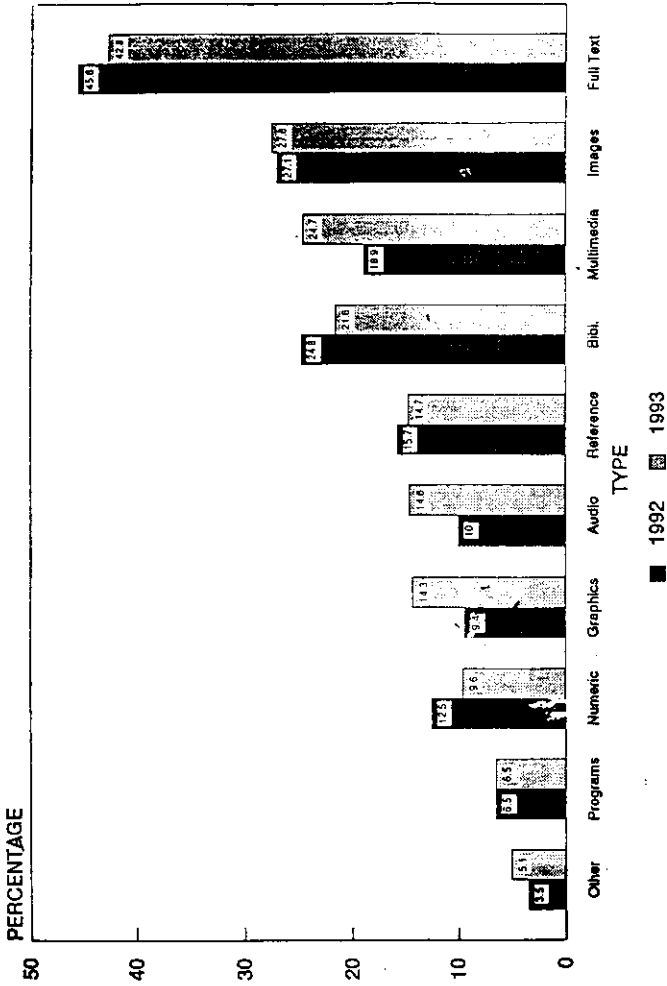
Language	1992		1993	
	Number	Percentage	Number	Percentage
English	1489	62.5	2554	71.0
French	210	8.5	290	8.0
German	192	8.2	283	7.3
Japanese	128	5.6	213	5.9
Italian	122	5.5	173	4.8
Spanish	103	4.7	202	5.6
Dutch	83	3.8	115	3.2
Danish	16	.7	28	.8
Swedish	22	1.0	28	.7
Hebrew	6	.2	28	.7
Cantonese/Mandarin	9		21	
Portuguese	5		19	
Norwegian	11		17	
Greek	9		14	
Finnish	11		12	
Latin	5		12	
Afrikaans	4		5	
Hungarian	3		4	
Czech	0		4	
Flemish	4		3	
Russian	2		3	
Coptic	0		2	
Greenlandic	1		1	
Icelandic	1		1	
Welsh	1		1	
Korean	1		1	
Catalan	0		1	
Slovak	0		1	
Not specified	350		479	

Many discs contain information in more than one language.

TFPL Publishing 1993

Figure 3:

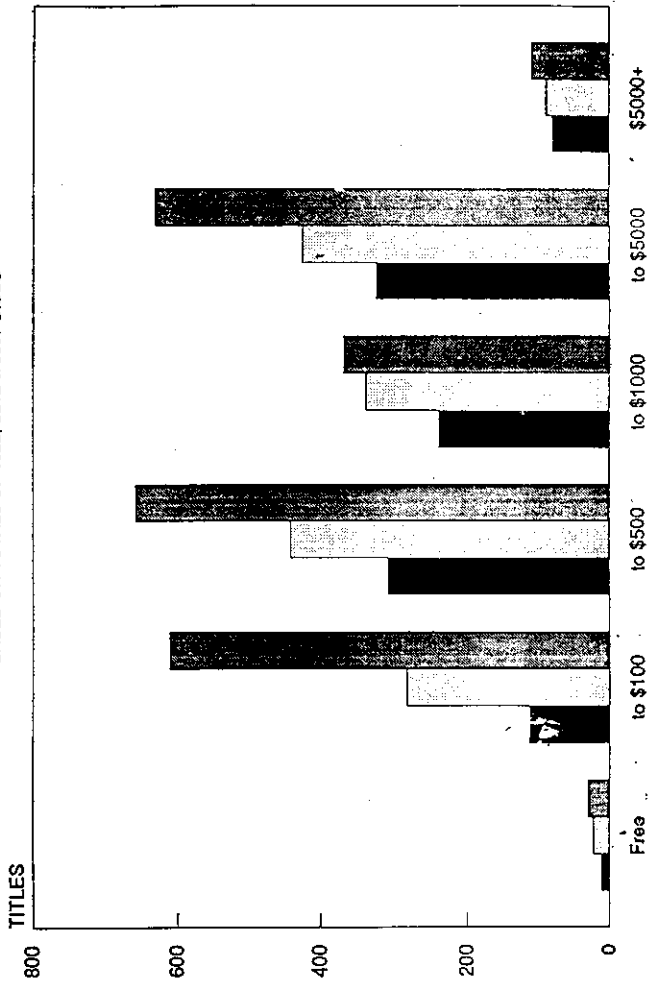
CD-ROM & MULTIMEDIA CD TITLES BY TYPE 1993



Totals sum to more than 100% as many discs contain more than one data type  
 TFPL Publishing 1993

Figure 4:

PRICE RANGE OF CD-ROM & MULTIMEDIA CD TITLES 1991-1993  
BASED ON TOTALS OF 1522, 2212 & 3597 DISCS



■ 1992 ■ 1991 ■ 1993  
TFPL Publishing 1998

## **CD-ROM AND ITS POTENTIAL AND PROBLEMS IN PART OF THE PACIFIC**

**By Carol Mills**

**Abstract:** As elsewhere, CD-ROM is a medium which has potential for delivering information not otherwise available to information seekers in the Pacific. In the Pacific as in countries in other developing areas, there remain obstacles to the free availability of CD-ROM technology. Telecommunications outside the home country are still beyond the financial reach of most users, impeding networking beyond the home country. The non-standard and ageing range of computer hardware used and lack of trained backup staff are among the difficulties. Individual CD-ROM subscriptions are barely affordable, the number which can be afforded limited and license fees are out of the question. Potential users in this region are less aware of the possibilities of CD-ROM because of lack of exposure to communications technology. The University of the South Pacific Library, as a leader in such technology in its region of twelve member Pacific Island nations has had some success with working to bridge these gaps; but there is a long way to go before Cd-ROM is used in the region to best advantage.

For a world-wide library network to work publications and information must be affordable. Some information does not now appear in print at all, only in an electronic format. The increasing use of information technology has widened the gap in some ways between first and third world information seekers, rather than narrowed it.

The costs of using electronic media, particularly payment for telecommunications beyond the home country, are obstacles for smaller or poorer nations, keeping their government, researchers and students information-poor. Some are dearer than the previous paper alternative. Increased subscription charges for printed sources, brought about by shorter print runs, result in cancellations by libraries which lack the funds to pay for the increases.

The University of the South Pacific has now been in existence for twenty-five years. Our membership is of a group of twelve countries; Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Western Samoa. Fiji with almost 800,000 residents is the

largest, and Tokelau with 1700 or so the smallest.<sup>1</sup> USP has a Charter, which defines its purpose in the region. In essence this empowers USP through education, research, advice, and liaison with other institutions and bodies to work for the better provision of education, training, consultancy and research to the communities of the South Pacific.

The range of CD-ROM services is expanding. Cd-ROM services could offer a part-solution to the information gap or scarcity of materials to regional governments, researchers and students. Various circumstances limit the immediate widespread use of CD-ROM in the Pacific. They can be grouped as follows;

#### Equipment

A variety of hardware of varying ages and types can be found around the region. CD-ROM players and servers, etc. remain rare. With CD-ROM, regardless of demand, in the least expensive configuration one machine serves only one user at a time. To spread use the library must have more PC's and/or access to Local Area Network (LAN) technology. Multiple PC's let alone access to a LAN are not there in most cases. To put networks in place requires good local telecommunications. Even the basic tools of communication (modems) are not common in smaller Pacific countries. The potential cost for a small community to establish these links may be beyond their reach.

#### Backup

Until recently the equipment, training and technology required to support automation in libraries of the region was completely unaffordable. This is changing. Giving suitable professional and technical backup, it is becoming more feasible for small Pacific libraries to use computers.

The level of technical skill required to operate and maintain a personal computer has diminished. Nevertheless the problems in the Pacific can begin at the level of knowledge and skills to maintain hardware and to carry out routine troubleshooting. There is the added difficulty that the local climate is hard on computer equipment and software. Even if it is located in an air conditioned space, which is not very common, a computer remains subject to the intermittent failures of the local power supply, or may have to be run off a generator, with the power supply problems which go with that.

Trained programming help for trouble shooting, is something which is within the reach of most individuals and organisations in metropolitan countries. This is not always so in the Pacific. Such things as awareness of current viruses and the means to deal with them may be absent.

## Networking

Limits to availability of telecommunications to reach providers in other countries and hence share their information facilities are a major obstacle. In a recent "New Scientist" article, Holderness stated that more than half of the world's population has no access to the telephone network<sup>2</sup>. A lack of telephones is certainly the case in Fiji and other parts of the Pacific outside the larger towns when access to telecommunications may be at the level of sharing the village radio telephone; patently of no use for electronic data reception.

Even when these difficulties are overcome there must be compatibility of equipment, and of the satellite used, between the countries. For example, there are at least two satellites in use in the region for voice transmission.

## Licence fees

Most Pacific countries do not have copyright legislation, and most are not signatories to the various international intellectual property conventions. Consequently they are not keeping abreast of technology in their copyright legislation, and are not bound to recognise the rights of others at law. At a meeting in 1976, the legal officers of several countries of the region expressed their uneasiness with the concept of copyright in the face of the potential which if offered for conflict with traditional culture and custom.<sup>3</sup> This was still the stand of some countries at a World Intellectual Property Organisation workshop in Suva last month. A few countries, notably Fiji, have legislation, although dated. Fiji's based on the pre-independence British legislation of 1956 is the most up to date. It is dubious if publishers of CD-ROM realise this, but if there should be expansion in use and breaches then occur, this could be an obstacle of its own to expansion without suitable contracts with CD-ROM users.

Most existing intellectual property law has not kept pace with CD-ROM. Licensing has been established to deal with concurrent use. Licensing is simply unaffordable. USP Library runs an on-campus CD-ROM network. The number of products offered is small. Attempts by USP Library to explain to suppliers that our expansion in usage if we were to network their products would be minimal in the early years, and that if they were to grant licenses which we could afford that there might be long-term usage benefits have largely fallen on deaf ears. Consequently we have been unable to network any product which is not in the public domain.



## Use / expertise

Many countries of the region are still awakening to the range and potential of the materials which libraries can draw in for them to assist national cultural and practical interests. The information-seeking behaviour of many potential library users has not yet developed. Unsupported para-professionals are not fitted to offer the range of skills which would augment the perception of the potential of libraries in their respective countries. The situation is improving as perceptions of libraries and what they can offer broadens, but the spiral of lack of awareness and poor pay continue to be the revolving cause and effect of the short supply of librarians.

There is frequently no pool of potential library staff to draw upon when vacancies occur. It is not uncommon to have to recruit a beginner to fill a library vacancy in smaller Pacific countries; a beginner in need of training from basics. In addition recruitment gaps in the Pacific can last months or occasionally years between appointments. There is a problem of retaining staff in the face of turnover. It is not uncommon, particularly in smaller communities, for the well-trained and educated to move on to better paid and bigger things; or to emigrate.

Even if CD-ROM products continue to become relatively cheaper, for many countries the equipment itself, and the technical backup which it requires is sufficiently scarce that familiarity with its potential it will not become common for some time to come. The other problem is that most regional library staff away from the very largest libraries are para-professionals or trainees. However enthusiastic, they are frequently working in isolation in remote areas without professional contacts and awareness or support or local supervision.

Lack of education in automation breeds a lack of knowledge and confidence to expand services into new media. The coverage of the University of the South Pacific's librarianship curriculum is largely as might be expected anywhere. Courses are offered exclusively by distance education. Teaching the skills needed to gain access to the information of the world is not possible because of the difficulties of teaching automation in any mode other than face-to-face. The uneven distribution and variety of automation hardware in the home countries of students is a problem for our curriculum, as many libraries have until recently been constrained to share the hardware of their parent body, where this hardware exists. There is the further matter of there being a lack of technical staff to provide students with the on-site backup. Consideration has been given to conducting summer schools on aspects of automation to overcome this difficulty, but has not yet proceeded. One factor to be overcome is the costs involved in getting students to such courses. The original thinking behind the use of distance education by

USP was to avoid the cost of travel for students and their governments as likely to act as a deterrent to enrolment.

### Products

The cost of maintaining subscriptions to CD-ROM services is a major factor. Many library budgets are smaller than the price of just one subscription. Aid donors have been reluctant to make an ongoing commitment to subscriptions to serial titles, and now to CD-ROM services. No broadly definable trend has yet emerged in the field of aid to provide CD-ROM subscriptions. Some specialised aid projects such as that of CTA (Technical Centre for Agricultural and Rural Cooperation) and the Royal Tropical Institute in Amsterdam, which has introduced CD-ROM technology at 11 sites in 8 countries, including in Western Samoa and Fiji have recognised a need. When such aid is given there is the difficulty of continuing when the recipient is on his own after aid ceases. The money to keep some of these projects operational is simply not there without financial support, even though some of the obstacles such as introducing expertise and hardware into a particular facility are overcome by some projects.

Some publishers have not extended their coverage from print to CD-ROM, others have started new products on CD-ROM without producing a print form. For libraries of the Pacific, these latter are a particular problem until CD-ROM technology becomes more widely distributed. The coverage of CD-ROM mainly falls into three groups; locally generated bibliographical tools, commercial bibliographical and abstracting tools and full-text services. Each has their uses.

**Local bibliographical.** These are vital for the information future of our region, as there are books and periodicals published in the region which are not accessible to the region (or to the rest of the world), as they are not covered in more widely distributed indexing and abstracting services, bibliographies, etc. Such tools would provide the means to improve access to unique local materials such as manuscripts and pictures, and to handle records of material such as sound collections in the areas of oral history and music. USPL is contemplating production of a South Pacific CD-ROM bibliographical service which utilises a range of existing bibliographical input. The other possibility, possible production of a widely distributed USP Library CD-ROM catalogue is looking more feasible.

**Commercial bibliographical and abstracts.** These perform the role expected of them elsewhere, but with the important difference that what they are the key to is mostly not going to be locally available. More frequently than elsewhere the product of a search of a bibliographical source will be an inter-library loan request. The cost of the seemingly basic inter-library loan may not be affordable,

or frequency of requests may be limited by the means of the country, the budget of the library or of the user. Lenders may waive charges to particular libraries, but this is by no means certain, and the option to do so is not always open to the host if his own budget is to balance. Even where libraries abroad do offer free inter-library loans, costs to make requests or to return items to the lender can be a limiting factor.

Full text; these are where the potential for significant collection augmentation lies. However the subscriptions to major services such as "Business periodicals on disk" and "ADONIS" are beyond the financial reach of the libraries of smaller or poorer countries, especially as there may also be royalties for usage unless the library already has a hard copy subscription, which is not the point. Libraries which are aware of these services see them as an alternative to the hard copy subscription. Market forces are working to reduce these factors. Prices seem to be stabilising or declining and can be expected to continue to do so. As the medium gains popularity, publishers should be more willing to allow republication in this form, broadening coverage. CD-ROM will then be in a position to support libraries in regions such as the Pacific to offer a better range of services and materials to their users.

USPL has experience and skills, and has the technical and physical ability to assist others. Financially there can be limitations. Regional travel is expensive and there is no substitute for the presence of an expert or helper with the trainee. In some areas USPL is already active, most notably with the PIMRIS (Pacific Islands Marine Research Information System) project, which is based at USPL. PIMRIS' membership is wide, being drawn from that of the South Pacific Commission, working out of marine or fisheries departments in member countries. Many PIMRIS members have now been trained to use the inexpensive UNESCO sponsored package CDS-ISIS to catalogue their material. Work done by PIMRIS members using this has been successfully downloaded on to the USPL's URICA 2000 system, to generate the MOANA data base, which PIMRIS checks in response to researchers' requests received from all over the world, and which is now being distributed on floppy disk to contributors. As I see if the future of MOANA lies with CD-ROM. Being aid-funded the long-term nature of PIMRIS cannot be predicted. The model exists, but so too does the paradox, as without financial support or aid USPL can only do a certain amount for the region when this is not for USP itself, because despite the Charter's powers, USP must properly use the funds which are allocated for the designated function of the allocations, limiting flexibility to diversify our activities.

Wide adoption of CD-ROM would have its benefits, as there would be less need for the use of telecommunications than would otherwise be the case. It is to be hoped that the difficulties can be overcome. We would hope to foster the development of use of CD-ROM within the countries to which we have an obligation to assist in their development. We hope to produce a USP catalogue on CD-ROM for particularly regional distribution, thus minimising inter-library loan costs for regional colleagues. At this stage most libraries in these countries will not be able to take up the use of CD-ROM to any major extent unless USP and others can cope with, or turn around, some or all of the governing factors.

#### Notes

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# **FULL-TEXT AND BIBLIOGRAPHICAL DATABASES ON CD-ROM IN RESEARCH LIBRARIES - COSTS, SERVICES AND TECHNOLOGY**

**By Lars Nondal**

**Abstract:** Service, cost and technology implications of investments in CD-ROM Databases in Research Libraries are discussed. CD-ROM databases should be considered an integral part of your services, next to your online public access catalogue (OPAC). And therefore they should be subject to the same critical evaluation as other services. Some preliminary remarks are made about evaluation of on-line and CD-ROM services, regarding quality and availability. The costs for CD-ROM may not at first seem prohibitive, but they may grow as you encounter several difficult technological problems in your CD-ROM development.

## **1. Introduction**

In this paper I will elaborate on 3 different aspects of the introduction of CD-ROM databases in research libraries, that is services, costs and technology. It is not going to be a complete checklist to be consulted when considering to invest in CD-ROM. Nor it is my intention to describe in detail how we did it at the Copenhagen Business School Library (CBSL) when we started with CD-ROMs as the first research library in Denmark in 1988. I will of course draw heavily on my own experiences at CBSL, but I will include also impressions from elsewhere.

CD-ROM databases should be considered an integral part of your services, next to your online public access catalogue (OPAC). And as an integral part of your services it should then be subject to the same kinds of critical evaluation as other services. Some preliminary remarks are then made about evaluation of CD-ROM based services. Investments in new services and technology can not be made without regard to costs. The costs may not at first seem prohibitive. But they may grow as you encounter difficult technological problems. There are for instance no ready-made solution for making the CD-ROMs available on computer networks to remote departments.

As mentioned before, this is not the story about the implementation of CD-ROM databases at the CBSL. But anyway, we started in 1988 with one CD-ROM database on a standalone PC. We now have 14 different CD-ROM titles, mostly in the

field of business & economics, and a number of linguistic & terminological databases. Some of the CD-ROMs are available on computers connected to a small local area network. We subscribe to BPO (Business Periodicals Ondisc), the full-text version of ABI/Inform from UMI/Data Courier. We have just started a project for making some of the databases available through a computer network, connecting different CBS departments spread around town. Of course our experiences are not necessarily typical, but I think that many research libraries have had very similar problems.

## 2. Services

What kinds of new or improved services can justify the investment in CD-ROM databases? I will here only give a very simple description of the services that can be expected with CD-ROM databases

The most obvious service improvement is access for the end-users themselves to a **database with new information**, i.e. information which the library in question previously was not able to deliver. For one of two reasons. Either the information was not formerly available neither in paper nor online, why we certainly are talking about a new database. Or the same information was in fact available on-line, but for reasons of budgetary restraints, manpower shortages or organizational difficulties the end-users in practice was not given the possibility of retrieving the information. On-line databases have at the CBS practically only been available for researchers or external users who could afford the costs, and not for the students who couldn't.

But this improvement in services may be qualified. Talking about **bibliographical databases** only, arguments for the investment can be given in two ways. It gives end-users either **far better means for searching our own journal collections**, or secondly **search facilities in databases covering new kinds of publications** of major interest for end-users, which previously was not very well covered by research libraries.

The introduction of CD-ROM databases dramatically improves retrieval facilities in **your own journal collections**. For many research libraries the first CD-ROM database was be a bibliographical database, which indexed at least some of the journals held in their own collections. Thereby being an instrument for activating parts of the journal collections, and presumably increase the use. A use of the very costly journal collections which could not be provoked with the on-line databases or the bibliographies. CD-ROM bases could then be one way to envigorate your journal collections. The introduction of a bibliographical database on Cd-ROM will at first give better search facilities. But not better or quicker document

delivery. So the introduction of a database which not only refers to local holdings, but outside materials as well should be made with due respect to the perhaps heavily increased demand for inter-library lending.

Especially within the business field other CD-ROM databases provide access to publications and materials that are very important for end-user, but which are generally not very well covered by the OPAC. I am thinking of CD-ROM products with full-text of or references to articles from newspapers, industry reports, market reports, etc. Information needs like market information, company information and industry studies are not well suited with all the monographs in the OPAC, but much better with newspapers and stockbrokers reports.

The services you will be able to provide when investing in full-text products are somewhat different. You will get a search/retrieval facility for articles as well as immediate document delivery. Because of the document delivery you should look at the investment in the product as you normally would do with acquisition. You should decide whether investment in the product further optimizes your acquisitions budget in terms of user needs. It will eventually be a supplement to your collections, and you will have to decide whether the overlaps between paper and CD-ROM journals will be to large, or whether the journals available in the full-text system are core journals, peripheral journals or totally irrelevant.

## 2.1 Evaluation of services

This description of service implications have been very short and superficial. I think it will be more interesting to discuss how CD-ROMs themselves and the CD-ROM based services then perform, when you have made the investment and tried to integrate them with your other services.

The CD-ROM is an externally produced database which is then imported into the library. And alongside your OPAC it might quickly evolve into being a major tool for providing access to both internally and externally located materials. As such CD-ROM should then be treated as an integral part of your capital resources, and therefore subject to critical evaluation, economizing and optimizing as your other resources should.

The CBSL last year carried through a very large project evaluating library services. This study hardly touched upon the CD-ROMs, but as the CD-ROMs will be integrated even more in overall services, it will be important to develop a methodology for evaluating CD-ROMs and CD-ROM based services. I will not go that far here, but limit my discussion on evaluation of the service implications of CD-ROMs to considerations on two essential concepts, quality and availability.

The introduction of CD-ROM databases in research libraries makes the traditional division between **internal** and **external** databases irrelevant. If the CD-ROM databases are made accessible for end-user through the same terminals or computer nets as the OPAC to him they will both seem internal.

However, there will be some considerable differences between these two kinds of "internal" databases. The OPAC is produced locally, why the **quality**, when it comes to searching & retrieval facilities, depends on local cataloguing and classification decided procedures and actual practices. The quality is completely under local control.

The CD-ROM database has its own retrieval system, with or without classification codes, keywords, abstracting etc. These systems may be good or bad, one thing is for sure: they are absolutely out of local control.

One major problem will of course be that end-users will have to master two or more different retrieval languages and classification systems. Many CD-ROM databases have search facilities far superior to online catalogues, partly due to greater awareness of screen layout and help facilities. And as many CD-ROM databases have a historical background in subject-specific bibliographies, they also tend to have a more detailed, or specific classification system. The users have never understood much of the traditional "universal" (all-covering) classification systems used in research libraries, and are only able to use very simple search commands. So without any further arguments I will make the preliminary conclusion that the search/retrieval facilities on CD-ROMs are not a problem in itself. The major problems stem from the incompatibility between retrieval languages and classification systems.

Many bibliographical CD-ROM bases include abstracts and that definitely increases users chances for finding relevant materials with free-text searching. Abstracting and free-text searching are not known in the OPACs.

Quality is a very incomprehensible concept, And I will not here go further into the problems of quality in these matters. I only want to repeat that CD-ROM databases as any other capital resources must be critically evaluated, and that facilities like **subject-specific classification systems, abstracting and free-text searching** does not necessarily puts the CD-ROMs far above the OPACs when it comes to the quality of search/retrieval facilities.

The problem with document delivery services is one of **availability**. In the 1992 Evaluation Study of the Copenhagen Business School Library large parts are devoted to defining and measuring availability. Availability is definitely more comprehensible than quality.



"For good service to be provided materials pertinent to the users must be acquired or borrowed by the library, and made available to the users when they need them. With regard to availability four different conditions may be distinguished on the basis of the outcome for the user:

- **unavailability:** the user cannot get wanted materials at all or in time;
- **immediate availability:** the users get the wanted materials immediately (i.e. in the CBSL - directly from the shelves);
- **delayed availability:** the user gets the wanted materials after a period;
- **insufficient availability:** the user cannot keep the wanted materials as long as needed."<sup>1</sup>

These different variations of availability are then discussed and the results of a Direct User's Questionnaire are analyzed. But as the Evaluation Study is largely about the OPAC and OPAC-related services and hardly touches upon evaluation of the CD-ROM based services, I will try to make some perhaps premature remarks about these concepts of availability when it comes to CD-ROMs.

First of all the CD-ROM is not a locally produced database with local holdings only, why availability not only depends on quality of own services, but also those of others. Unavailability is then very likely. The CD-ROMs generate demands for inter-library lending, but have no effect on the abilities to fulfill this demand. The students are the largest user-group of the CD-ROMs, and generally they don't have time to wait several months for obtaining materials from outside. I could mention a couple of otherwise excellent bibliographical CD-ROM databases where this is a fundamental problem. CD-ROMs highlight on one of the weakest points in library services as the full exploitation of the improved search facilities calls for improvement in the quality of inter-library lending.

Full-text databases of course do not generate these problems concerning availability and document delivery. But others may arise. Instead of letting the end-users make the printing-out of the full-text articles from BPO themselves we have chosen to centralize this function. After filling out an order form the students are requested to pick up the print-outs the next day. So we don't have immediate document delivery anymore - only delayed. Not very much, though!!!

Other problems concerning availability may be more disadvantageous for the CD-ROM databases, both the bibliographical and full-text ones. One is the question of **updating**. How promptly are references from new issues of journals indexed and made searchable in the database? How quickly are new issues of journals made available through full-text CD-ROMs databases? Some of these problems are the

same for online versions of the same databases, but as there is an inherent timelag for CD-ROM compared to online, information on updating may be crucial, but this information is very seldom available for system managers or librarians, as the database is not produced locally. They have to find out themselves, and in many CD-ROM products documentation on updating is simply not existing.

I have no systematical empirical data to justify this, but my impression is that the time-lag can be substantial. If you want **immediate availability** to some core journals, then you will not be satisfied with full-text CD-ROM systems. You are definitely not able to cancel the paper versions of core journals for your researchers or other primary users. And cancellations and thereby savings on the journals subscription budget may be crucial in creating the funding for the investment in the CD-ROM full-text system.

This problem is further increased as not all kinds of availability will be as satisfactory to the end-user. The researchers may not have the same notion of availability as the librarians. Routing of journals to remote departments is not possible with journals on CD-ROMs. And if a journal can not be routed to the institutes then it is not available in the eyes of the researcher. Alternative services to the routing of paper journals are very hard to comprehend, but could be the printing-out of contents pages from a number of journals. But that would be an extremely time-consuming service, especially if each and every researcher wanted to be kept informed on his own individual profile of journals.

To round up this discussion CD-ROMs can be (and must be) evaluated as thoroughly as any OPAC, but as the CD-ROMs are not produced internally the **quality** of the CD-ROMs themselves when it comes to search/retrieval facilities, classification policies and practices are out of local control. The document delivery services based on the CD-ROMs, the **availability**, depends not only on own services, but also those of others. The introduction of CD-ROM databases in research libraries is therefore could be the introduction of a trojan horse when it comes to quality!!

### 3. Costs

The costs when investing in CD-ROM databases may not a first seem prohibitive. But that may turn out to be wrong, as you have encountered on a technological path of development, that seems to lead to ever increasing costs. I will later specify the different technological stages you will have to enter as you integrate your CD-ROMs in your services. Here it will suffice to say that the costs for the system management, i.e. the general computer expertise and the administrative routines around updating etc. are substantial and hard to quantify in advance. A

certain level of internal computer knowledge are required to ensure maintenance of the machinery, and to ensure (almost) constantly functioning working-stations etc.

The hardware, i.e. the computers and the CD-ROM drives are getting cheaper and cheaper. You may have the computers already, or they could be used for other purposes as well, so the problems with raising funds for that should be overcome. The prices for subscription to the different CD-ROM products are what they are, more or less expensive. I will not comment on the pricing policies from different CD-ROM producers. But at least they are known, they can be anticipated.

But what about the indirect costs, of which some may be anticipated, but also some not foreseen or underestimated? Some examples: Some CD-ROM products now enables you to enrich the database with information about own holdings. And the other way round, you will have to include information on journals available on full-text CD-ROM systems in your OPAC. Two systems shall be kept updated, and at least initially that timely.

Interlibrary lending must be expected to increase, and it tends to be a more expensive and time-consuming service than lending from your own collections.

Extensive teaching of information librarians are required. One problem is of course the search and retrieval languages that differs from OPAC. But another important problem is getting librarians used to the somewhat unknown and unfamiliar kinds of materials and information accessible on the CD-ROMs. Stockbroker reports, newspapers etc. are not materials very well known to librarians, and to enable them to assist end-users in using the databases extensively training will be needed.

Even if the CD-ROM systems claim to be self-explanatory many end-users needs extensively guidance and help. We have not at CBSL regularly arranged courses in our CD-ROMs, but evidence tells us that courses and even presentations definitely influences the number of students who uses the systems and how they do it. My experience says that the CD-ROMs in fact are as self-explanatory as our OPAC. If we need courses in searching OPAC we definitely also needs courses in searching CD-ROMs!

A perhaps very special example of a very time-consuming side-effect could be the printing of article from the full-text system Business Periodicals Ondiscs. Users are requested to fill out orders forms and to pay in advance. We thereafter make the print-outs and the users can collect the articles the following day. Of course this could have been arranged otherwise. This problem clearly speaks is in favour of full-text CD-ROM systems based not on scanning of images, as the BPO, but on

the ASCII-format that easily can be downloaded to floppy-disks or printed on an ink-jet printer.

#### 4. Redistribution of resources

Above I haven't tried to quantify the costs when investing in CD-ROMs. Instead I will try to summarize the discussions on services and costs by looking at how the actual funding was raised for the investment in CD-ROM databases. Of course you cannot on a budget always see what items have been cut down because other items should increase. But anyway, my argument will be that the introduction of CD-ROM databases creates a - intentional or un-intentional - redistribution of funds between the major users groups in a research library. Some user groups carry the costs, i.e. the cut-backs, while other user groups will receive better services.

The funds for investing in CD-ROMs can be obtained from different sources. In times of limited budget - I think it is fair to point out the following sources: **external funds** - either grants from funds or organisations or perhaps income generated by information services for external users, i.e. corporations, institutions etc. or **internal funding** - through cut-backs on on-line searchers and journals. The balance between these possible funds of course depends on local conditions. The external funding are of course important when raising money for expensive full-text systems that can not be bought within normal library budgets. Apart from external funding for our full-text system we financed our CD-ROMs by cutbacks on journal subscription account and the account for on-line searches.

Our users can be divided into the following groups: students at the CBS, researchers at the CBS, private companies and students at other institutions. Some years ago the library out of its own money financed searches in external on-line databases for researchers. We do not do that anymore, as the researchers to a large extent have access to external funds for their research projects, and thereby can come up with funding for on-line searches. For this reason, and for reason of the CD-ROM investment our on-line account has decreased considerable. The subscription costs for the CD-ROM databases are technically placed on the periodicals account, which have been under serious strains the last couple of years. Because of the budgetary restraint and the CD-ROM investment several journals have been cancelled.

Traditionally our journals have been more intensively used by our researchers than our students, partly due to a routing service of new issued to the institutes.

The CD-ROM databases are accessible from working-stations in the library only. And even though the CD-ROM have been marketed more to the researchers than the students, the students who uses of the bases far out-number the researchers.

Therefore the introduction of CD-ROM databases, accessible from working stations in the library only, and financed by cut-backs on on-line searches and journals, in fact is a considerable distribution of resources from researchers to students.

But if and when the CD-ROMs eventually will be searchable on networks accessible through computer networks at the institutes this will be a major service improvement for the researchers, and them only. At this time, and it will probably be some years later, resources will then be redistributed back to researchers from students.

To summarize, the students will with the introduction of bibliographical CD-ROM databases experience far greater search/retrieval facilities and access to new kinds of publications. So will the researchers, but only those who regularly comes to the library. With the introduction of full-text systems the students will get immediate document delivery as well. So will some of the researchers, but others will perhaps be more affected by the eventual cancellation of core journals and diminishing routing services, and thereby, in terms of availability, delayed availability.

## 5. Technology

The introduction of CD-ROM databases in research libraries are also the introduction of new data storage medias and new technology. A technology which at the starting point is less well known or controlled by the libraries than the technology that produces the online catalogue.

This may at first seem paradoxically, as the CD-ROM database is a PC phenomenon, and as libraries tend to be well.equipped with PCs. But these computers tend to be strictly for internal use, for administrative purposes, writing letters etc. The OPAC is not a based on PCs, but is a mainframe system based on dumb terminals. The CD-ROM databases are running on a MS-DOS platform, while the OPAC could be running on a UNIX-platform or other dedicated operating systems.

These problems may not be frightening as long as you only have a couple of CD-ROM databases running on one or two **standalone working stations**, completely separated from the OPAC.

There may be some technical problems in the beginning, but they can be overcome. You have to upgrade your PCs MS-DOS with a controller card, controller software and Microsofts MS-DOS Extensions which will control the traffic between the CD-ROM disk drive and the software application which wants to read on that drive. Making the CD-ROM drive behave like a hard-disk.

But the standalone working station will not be standing alone. You may want to integrate your CD-ROM bases in a little local area network, a LAN. Reasons may be plenty. Our system management wanted a separate room, away from the users, with a centralised server and a number of CD-ROM drives. Their concern was to eliminate users handling, and possible mistreatment, of the CD-discs. Another concern was establishing access to CD-ROM bases from other rooms in the same building.

At first this may be a independant physical network. Either with a central server and a number of PCs as working stations with access to a menu of CD-ROM-databases. The search software for each database is installed on each working station, and therefore it is only the bibliographical data which are transmitted through the network.

Next you may want to introduce a dedicated file-server in your network. The software for the databases are no longer installed on each working station, but only on the file-server. When starting a session the software is loaded into the working-stations over the network, while the bibliographical data are still transmitted through the network during the search session. A file-server configuration have considerable advantages for system management.

Next step would be to integrate the logical CD-ROM network with other existing networks. It could be the network which is running the integrated, terminal-based library systems. The CD-ROM network will then no longer be a separate physical network, but a logical network on a physical net with perhaps other logical networks.

But this step is not without problems. You might have to establish both MS-DOS-based and UNIX-based networks on the same physical network. The MS-DOS based system could be based on the Novell, Lantastic or other PC-LAN net-software (f. ex. NETBIOS-protocol), while the UNIX-based system could be based on the TCP/IP-protocol. And to get these things compatible demands considerable computer knowledge.

One way to solve this problem would be to not only produce the CD-ROM databases on a MS-DOS platform, but also alternatively on a UNIX-platform. Some

CD-ROM products are already made ready for Windows, but I haven't met commercial CD-ROM products running on a UNIX-platform.

On the other hand you could in principle enlarge or broaden the existing CD-ROM networks, running on some kind of PC-LAN software, to becoming large campus-wide networks. But as the CBS had already installed a TCP/IP network between its geographically dispersed departments this solution was not available for us.

Thus, the CBSL and other libraries who have entered this stage are forced to get these two different kinds of networks, and thereby operating systems of network protocols to work with one another. And it seems as there is no ready-made solution to this problem at the moment. Why solution depends on local computer knowledge and innovativeness.

At the CBSL we are working on making a gateway-function between the PC-LAN (Novell) and the campus-wide WAN (TCP/IP). The actual outcome is not yet known. The MS-DOS based CD-ROMs are still single-user products, and as UNIX is a multi-user and multi-function operating system, work is done to design a front-end enabling several simultaneous users on the CD-ROMs.

CD-ROM is in fact a very slow technology. The access to a CD-ROM drive is up to 20-30 times slower than the access speed on a hard-disk, and it is further slowed down situations with more than one simultaneous users. Therefore it is also considered to load the content of the CD-ROM discs to large hard-discs.

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# CD-ROM IN DEVELOPING COUNTRIES: A UNESCO PERSPECTIVE

By Abdelaziz Abid and Denise Pélissier

**Abstract:** UNESCO set up a Clearing House in 1992 to promote and disseminate the information it gathers and to create new information sources corresponding to the needs of Member States. A survey of needs showed a strong demand for CD-ROMs, and the success of a prototype, *UNESCO Databases*, encouraged it to prepare a new edition and plan two more CD-ROMs, *Index Translationum* and *World Heritage*. Another programme involves the CD-ROMs of full text as a means of helping less developed countries to obtain affordable economic access to literature. An agreement has been reached with ADONIS whereby free subscriptions to the ADONIS discs for 1991 and 1992 are given to ten selected institutions in Africa, the Arab states, Asia, and Latin America and the Caribbean. A further initiative is the joint ICSU/UNESCO International Network for the Availability of Scientific Publications, a cooperative network of donors and recipients. Training workshops are also being held in different parts of the world, and an inventory of CD-ROM in developing countries is being prepared.

## Introduction

This paper addresses two separate issues: firstly the dissemination of UNESCO databases on CD-ROM and secondly UNESCO activities to promote CD-ROM in developing countries.

### Disseminating UNESCO databases on CD-ROM

Like all its sister agencies of the United Nations system, UNESCO gathers and disseminates large amounts of information, which is stored in its various information systems, documentation services and databases. This information relates to very varied fields of knowledge falling within the competence of the Organization.

In order to enhance the use of its existing databases and information services, UNESCO decided to create a Clearing House with the following objectives:

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- promote and disseminate existing stored of information;
- create new ones corresponding to the needs of Member States;
- make existing information available efficiently and economically through the use of traditional media (printed materials, microfiches) and electronic media (on-line access, consultation on CD-ROM, distribution of diskettes, etc.)

The Clearing House was set up in January 1992. It functions as a network, using the existing infrastructure that includes all UNESCO libraries and documentation centers at and away from Headquarters.

During the Clearing House feasibility study an analysis of Member States needs was conducted by means of an international survey through interviews in about fifty countries. Approximately one thousand questionnaires were collected worldwide between October 1990 and February 1991.

The results revealed a strong demand for on-line access (62.8%) and CD-ROM (52.5%). The survey also showed that there was a significant level of installation of CD-ROM drives, 26.4% of all those who answered the questionnaire had access to one. On the basis of these findings it was decided to issue a CD-ROM prototype giving access to bibliographic and referral data and to make available on-line some UNESCO databases

### UNESCO CD-ROM prototype

A prototype using micro CDS/ISIS software and a user-friendly interface was produced in 1991. About 300 copies were mailed in 80 countries between November 1991 and April 1992. An evaluation questionnaire was sent to all sites and a report was issued in August 1992<sup>1</sup>. The results of the pilot experiment confirmed that this technology is well adapted to disseminate UNESCO information worldwide. A paper was delivered at last IFLA conference in Delhi describing in details this experiment<sup>2</sup>.

Consequently a new CD-ROM edition was prepared in 1993. It includes the six databases of the prototype, and four other databases. The title of this CD-ROM is "UNESCO databases".

Two other CD-ROM titles are planned. One corresponds to an already existing database: Index Translationum. The second one is a multimedia CD-ROM on World Heritage. An experiment of electronic management of UNESCO documents and publications will probably be launched in 1994 and in this framework the dissemination of the full text of selected documents on CD-ROM is also foreseen.

## UNESCO Databases CD-ROM

This CD-ROM contains 10 UNESCO databases and gives access to:

96,000	bibliographic references
9,200	research institutes and information services in the world
4,650	periodicals and
900	specialists in social sciences

It consists of the ten following databases:

UNESBIB	UNESCO documents and publications (49,000 ref.)
AIDS	Worldwide literature on preventive education against AIDS (2,000 ref.)
DARE	Worldwide institutions, periodical and specialists in social sciences (10,500)
ENERGY	Worldwide institutions concerning renewable sources of energy and energy conservation (4,000)
IAUDOC	Worldwide literature on higher education (4,500 ref.)
IBEDOCs	Worldwide literature on education (planning, literacy, innovations ... (15,000 ref.)
ICOMMOS	Museum, monuments and sites (26,000 ref.)
ISISDIF	National distributors of Micro CDS/ISIS software (50)
UNESDATA	UNESCO databases (77)
UNESIS	UNESCO Regional Offices Information Services (29)

The CD-ROM uses the micro CDS/ISIS software with a user interface (HEURISCO) developed by DBA (Società per la documentazione, le biblioteche e gli archivi) in Italy. This interface provides for user-friendly searching, printing and exporting. The disks can be used on any IBM PC or compatible with 640K RAM. All messages and user aids are trilingual (English, French and Spanish). This disk will be up-dated yearly.

## Index Translationum

Index Translationum is a multidisciplinary bibliographic database giving access to more than 500,000 references of books translated worldwide in all fields (literature, sciences, etc.) since 1979. Data is provided to UNESCO in magnetic tapes, floppy disks or in printed form by about 60 national libraries. The yearly growth of the database is 55,000 records. It is foreseen to produce in 1994 a cumulative disk containing all data since 1979. It will also run under micro CDS/ISIS software and use the same interface Heurisko which forms now part of this software package as the UNESCO databases CD-ROM described above.

## **World Heritage**

This multimedia CD-ROM prototype foreseen hopefully for 1994 will contain textual information in three languages (English, French and Spanish), maps and images on monuments and sites belonging to the World Heritage list (about 400 in 1993). This disk will run on any IBM PC compatible with 640K, a VGA screen and a mouse.

The disk will comprise 2 parts:

The **first part** will be dedicated to the World Heritage Convention. It will provide the text of the Convention as well as general information in hypertext mode.

The **second part** will correspond to the textual and image database on the monuments and sites.

Each monument and site will be described in a record containing:

- Name
- Location
- Date of inscription on the World Heritage list
- Inscription criteria
- Short description (4 lines)
- Keywords

Each record will be completed by one or several images, a bibliography, a text of 1 to 3 pages, and when appropriate a ground map.

The database will be searchable by: maps, names, themes, country names and keywords.

A demonstration model has already been produced, containing data concerning fifty monuments and sites.

### **Direct access to UNESCO documents and publications**

UNESCO is aware that users need to access easily, quickly and economically the full text of UNESCO documents and publications. A first step has been achieved with the first CD-ROM "UNESCO databases" described above. However this disk provides, through UNESBIB, bibliographic references only and users are still faced with the difficult problem of obtaining the document itself. With this in mind, a medium-term project of electronic management of documents is under study. A pilot experiment is envisaged for 1994.

As documents of the General Conference and the Executive Board are the most requested, they have been chosen for the experiment. All word processing files will be collected and stored on optical disk and available internally through a LAN. A link with UNESBIB, the bibliographic database on the mainframe will be established. In a second step this full text database will be available through teleinformation networks (ISDN) and on CD-ROM.

### **Promoting CD-ROM publishing and use**

This part of the paper deals with another category of CD-ROM activities performed by UNESCO. These activities are oriented towards Member States with the aim of improving access to scientific literature in developing countries. A paper was delivered at the last IFLA Conference in Delhi, reviewing in detail UNESCO efforts to improve access to information in the South<sup>3</sup>.

All too frequently researchers in developing countries cannot afford to attend scientific meetings, subscribe to journals or buy books. In addition, links to e-mail networks and on-line databases are often impossible or prohibitively expensive. As a result of this situation, scientists in developing countries feel isolated and are understandably concerned. Recent years have seen an increasing number of pleas and proposals made to ensure equitable access to scientific information. UNESCO has been working for many years in this area. Initiatives undertaken by the UNESCO General Information Programme (PGI) to improve access to scientific information in the South include library development, training of information specialists, development of national document delivery services, subsidized provision of scientific journals and articles, book-donation co-ordination, promotion and indigenous publishing, twinning arrangements between libraries and promoting CD-ROM publishing and use.

It is now widely accepted that CD-ROM could help libraries in developing countries, provide quick access to at least some of the critical literature needed by practitioners, researchers, educators, students who could become productive users. CD-ROM technology has made it possible, for the first time, to provide vast amounts of information in a compact, user-friendly format.

Several conditions prevent, however, the immediate widespread use of CD-ROM in developing countries. These include the lack of knowledge about technology; reluctance of some publishers to allow republication of printed material on CD-ROM; and the cost of maintaining subscriptions to journals published on CD-ROM.

Market forces are working to reduce these factors. Prices are declining and can be expected to continue to do so. And, as the medium gains popularity, publishers will be more willing to allow republication in this form. CD-ROM will help libraries in developing countries to leap ahead into 21st century.

PGI has published, in 1988, a Guide to CD-ROM which provided practical information on CD-ROM hardware, software, services, products and related training opportunities. In 1992, the International Hydrological Programme of UNESCO published a guide on Information related to water and the environment: databases available online and on CD-ROM. This subject-oriented directory covers all subjects related to the water-cycle, as seen from a hydrological point of view. The directory includes, therefore, databases related to the natural environment, air, water, land and minerals, earth sciences, geology, minerals, pollution, climatology and acid rain, ozone depletion and global warming.

### **Journals on CD-ROM**

In 1989, PGI began to explore with the Japanese authorities the possibility of an extrabudgetary document delivery project mainly for the countries of Asia and the Pacific using modern information technology. The project would aim at the publication of core journals on CD-ROM, to be provided to libraries in developing countries according to their needs. It would be hoped that, after an initial injection of capital and a subsidy for operations over a period of about five years, the publishing system would be self-supporting, and the model could be extended to other developing regions. During a second phase of the project, vehicles for publication of scientific results from the region itself could be initiated. Funding for this project has not been secured.

One of the most notable attempts at publication of scientific journals on CD-ROM has been the ADONIS project which involved the dissemination of about 219 journals in the biomedical field on this medium for a two-year trial period. The aim was to demonstrate a technical solution which could ultimately be more efficient and less costly than photocopying journals for users while providing some royalties to publishers who have felt that widespread photocopying by libraries is unfairly reducing their revenues.

The results of the trial have been sufficiently encouraging for the ADONIS Board to decide to introduce a commercial service in 1991 covering some 400 titles.

An annual subscription fee is charged and royalties are to be paid depending on whether a library subscribes to the printed version of the journal. Royalties are

based on the automatic recording for articles printed or transmitted over a network (but not for items displayed on screen).

In the framework of an agreement between ADONIS and UNESCO, subscriptions covering journals published in 1991 and 1992 have been granted to the following ten selected institutions:

#### **Africa**

- Institut international de recherche scientifique pour le développement en Afrique (IIRSDA), Abidjan, Ivory Coast
- National Library of Nigeria, Lagos
- University Cheikh Anta Diop, Dakar, Senegal

#### **Arab States**

- Egyptian National STI Network, Academy of Scientific Research and Technology (ENSTINET), Cairo, Egypt
- Centre national universitaire de documentation scientifique et technique (CNUDST), Tunis, Tunisia

#### **Asia**

- Thammasat University Libraries, Bangkok, Thailand
- National Information System for Science and Technology (NISSAT), Ministry of Science and Technology, New Delhi, India

#### **Europe**

- Lekarska Fakulta Univerzity Komenskeho, Bratislava, Slovak Republic

#### **Latin America and the Caribbean**

- University of the West Indies, Kingston, Jamaica
- Instituto Venezolano de Investigaciones Cientificas (IVIC), Caracas, Venezuela

The agreement also covers on-site installation, training and project monitoring and evaluation. The subscription fees are paid by UNESCO on behalf of the participating institutions which are liable to pay a copyright royalty. UNESCO-sponsored sites can use UNESCO coupons to pay for their royalty invoices.

#### **INASP**

Another initiative to improve access to scientific publications in developing countries is the International Network for the Availability of Scientific Publications (INASP), established in 1992, under the aegis of ICSU and UNESCO. INASP is a cooperative network of donors and representatives of recipient institutions. The

Network has three immediate objectives all related to improving access to scientific publications, including material published on CD-ROM:

- to support and strengthen existing programmes involved in the distribution, publication, exchange and donation of books, journals and related materials (e.g. maps and charts, audio-visual materials, software and CD-ROM);
- to encourage new initiatives that will increase the availability of quality scientific literature;
- to identify methods that will permit the ongoing and sustainable exchange and distribution of scientific publications.

### Training

"CD-ROM managers need to be well trained if they are to be effective users of the technology. They must have basic computer skills (DOS, word processing, database management, etc.). Moreover, they should be able to trouble shoot if there are minor operating difficulties and there is no one available to help diagnose and solve the problem-. Thus, it is a mistake to assume that the only training an information professional needs pertains to information retrieval techniques. The person who operates the CD-ROM workstation must also be comfortable with the entire operating system. In addition, familiarity with the subject content of the databases to which the institution subscribes and an ability to ask end users precise questions are key to eliciting search results that meet the specific research needs of the requester."

This long quotation from a paper by Lisbeth Levey<sup>4</sup> stresses the need for training. PGI has organized, in co-operation with various partners, several training sessions. The Agreement with ADONIS mentioned earlier also provides for on-site practical training given on the occasion of the system installation.

A conference held in Khartoum in 1990, illustrated the appropriateness of CD-ROM to developing countries. Two hundred persons, from 16 countries, participated in this first International Conference on the Use of CD-ROM in Developing Countries, organized by the Sudan-American Foundation for Education, with UNESCO's assistance. The verdict of participants was clear: CD-ROM services offer the single best solution to the "information gap" or "book famine" besetting users in developing countries. This view was not only expressed by librarians, who would be expected to embrace CD-ROM as a solution to gaining access to at least some current information, but it was held even more strongly by end-users, who comprised the majority of the participants.

Several training workshops were held in different regions to promote CD-ROM use in library and information work. In 1991, a familiarization workshop was organized in Beijing, within the framework of ASTINFO for the introduction of CD-ROM to information workers and users. In 1992, a training course for French-speaking librarians was held in Bordeaux, in co-operation with the Banque internationale d'information sur les Etats francophones (BIEF) and attended by some twenty-five librarians and documentalists from developing countries, as well as Belgium, Canada and France. In 1993 a two-day workshop for African research librarians was organized on how to market CD-ROM services, was organized in Accra in co-operation with the American Association for the Advancement of Science and the Association of African Universities. Intended for information professionals who already have CD-ROM capability in their own institutions, the workshop covered marketing principles and methods, evaluation techniques and document delivery services. Twenty librarians from seven countries participated in the workshop.

UAP seminars, organized in co-operation with IFLA, contain also a module on CD-ROM. The most recently organized UAP meetings took place in Cairo in December 1992 and in Budapest in April 1993.

### **Inventory of CD-ROM in developing countries**

An international seminar on the use of CD-ROM and other optical compact media for the transfer of scientific literature took place in The Hague in 1991. This meeting was intended to lay the conceptual basis for pilot projects. The main working document, prepared for UNESCO by the International Federation for Information and Documentation (FID) discussed the technological, economic and copyright aspects of CD-ROM publishing. The participants recommended that a study be commissioned to assess the needs of developing countries for scientific literature and to review existing and planned programmes using CD-ROM or similar technologies. UNESCO was asked to take on this responsibility in light of its long-standing commitment to supporting the availability of source literature to scientists in developing countries.

The project, being conducted by Dr. Gilles Deschatelets, University of Montreal, Canada, includes the following components:

1. an inventory of CD-ROM resources (equipment, material and products) in developing countries;
2. a directory of CD-ROM sites and resource persons in developing countries; and



3. a directory of facilitating organizations that publish, distribute and finance CD-ROM in or for developing countries.

The first phase of this initiative (mail survey of CD-ROM sites and facilitating organizations) is now almost completed. Some 3700 questionnaires in English, French and Spanish have been mailed to 3300 sites and 400 facilitating organizations. By the end of June 1993, some 650 questionnaires were received, including 54 from facilitating organizations.

Two databases running on CDS/ISIS are being established, the first one (UNESSI) on CD-ROM sites and experts in developing countries and the second one (UNESFA) covering the facilitating organizations. The two databases along with an installation guide will be distributed to all participating institutions. A spin-off of the project is a third database covering bibliographic data on CD-ROM in developing countries.

It is hoped that this inventory will provide as clear a picture as possible of the CD-ROM scene in developing countries and Eastern and Central Europe. It is also expected that from this exercise will evolve various networks and mechanisms for co-operation including regular up-dating of the inventory and the establishment of regional and sub-regional directories. The real impact of this work will be an increased awareness and interest in CD-ROM technology in developing countries. There will be a need for setting up an international CD-ROM Clearinghouse for developing countries and Eastern and Central Europe. This Clearinghouse could act as a CD-ROM observatory and provide, at regular intervals, an overview of the CD-ROM market in developing countries.

In the long run, this study will achieve the expected catalytic and multiplying effect when interest in CD-ROM in developing countries will be further stimulated and new initiatives taken and projects launched as a result of the inventory exercise.

### **Conclusion**

UNESCO will probably disseminate more and more data on CD-ROM as it has proved to be an appropriate media for distribution of huge amounts of information worldwide both in developed and developing countries. It is particularly well adapted to the dissemination of all kinds of data and especially multimedia databases. This does not exclude distribution on traditional media such as printed publications as well as providing on-line access to selected databases.

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# **CD-ROM ENDUSERS IN THE UNIVERSITY LIBRARY. WHAT TO DO?**

**By Margarita Taladriz Mas**

**Abstract:** The need to instruct CD-ROM endusers at a new university library becomes difficult due to the different levels of knowledge of the users. Easy menu search interface, training endusers to be self searchers and training librarians to be trainers of endusers searching are the main objectives of the CD-ROM enduser instruction department in a brand new University.

## **Introduction**

The fact of getting started with a completely new information system like CD-ROM, becomes more attractive if that happens in a brand new library at a new university.

University Carlos III de Madrid is a public institution founded in 1989. Settled in two campus sites, one devoted to Social Sciences and the other to Science and Technology.

There is a single information system distributed between the two campuses with a centralized library in each campus but with a single coordination and centralized management.

The University works within an Ethernet network and holds a point to point link between the two campuses.

From the beginning one of the library's goals was to put information at the hand of the users, no matter in which campus or office they were. That means to have the right answer at the right time for the right person at the right place for the right cost.

We hold a single database for both libraries and the users can access to the database from their offices or from any of the libraries.

Our next objective was to do the same with CD-ROM databases. We started with a single drive and at this point we have a CD-NET that holds a 386 processor with 14 drives and Novell Network software.

By this time it is possible to access to the CD-ROM databases from any University Department, although it is not possible to access from any office. That will be the fourth step in our project.

So, right now, we do have 7.000 students and 500 teachers as potential users of a new service. How can we instruct them in the use of a technology? First of all is worth to say how fast libraries development has arrived to the spanish life. We are going through a big revolution in a very short period of time and it is becoming very difficult to get adapted not only for users even for librarians. Lets say more, it is even more difficult depending on the type of user: young students find it easier than librarians or teachers. They were born in the new technologies era! If we want to go one step further not all the students show the same attitude towards innovation. Science and technology and information science students are more eager to learn and use them than the law of business administration ones.

### **Why instruction?**

Accepting that end users are those people who will actually use the information sought and that end users are everyone except professional intermediaries, we can assume what a big task we have to perform to get our inexperienced users instructed to get the best and more accurate information.

Nevertheless, as long as they leave the library or the database department we will only be aware of "what" they take with them but, we will never know "how" the individual finds the information useful. The information chain "breaks" at that point.

Librarians have an ethical obligation with users:

- They have to explain to end users, parameters, limitations and hazards of searching.
- They have to have end users become aware of their limitations in achieving results.
- They have to teach them "how" to evaluate results.
- They have to teach them "when" to defer to mediated searching.

End users instruction can help not only the fact of searching but all the parameters pointed above. That would lead in a better understanding of everyone's capability and limitations.

Another point to be considered is the different behaviour of CD-ROM users versus on line users. CD-ROM users are willing in doing their own searches due to the

driven menu interfaces, in the meanwhile on line users look for an intermediate due to the complexity of command on line searching.

We want to focus our objectives in user education in three major points:

- Developing an easy menu search interface
- Training end users to be self searchers
- Training librarians to be trainers of end user searching

### **Menu Search Interface**

If we want users capable of doing their own searches it is absolutely necessary to easy the way. CD-ROM producers have promoted them as user-friendly, self instructional systems that require little on site assistance for use. Libraries have found this assumption questionable. Everydays work shows how many difficulties the user has every time he wants to approach information.

At our library, as I pointed above, we have a 386 processor with 14 drives and Novell network software. The databases are searchable from the library and the faculty departments.

A first step to develop was the possibility to accede to any database in the drive we developped a menu that allows the user to go to any database he is interested in just pressing the number that matches the database name.

Following one of the EEC action lines for libraries, devoted to research in menu interfaces and, with the collaboration of our Librarianship school, we plan to develop this winter, a menu search interface, at least for the most used databases: Abi Inform, Econlit, Sociofile, Colex Data, Aranzadi, Lisa ...

Even knowing that our users belong to different levels of knowledge and instruction, except for the librarianship teachers and students, when we talk of CD-ROM users, almost 85% stand at a very low level. It is so that we are starting our instruction from the very beginning and want to make it absolutely friendly for them. We don't want them to run away when they face what they consider a "difficult information tool".

### **End users as self searchers**

We really believe in the teaching task librarians have. We want to teach users "how to fish", not to give them a "fish everyday". Sometimes is difficult for some librarians to understand what their role is. They are not nurses to stay at the bedside during all the search process. We think our task is to instruct people and to be around improving tools that make information accessible to them.

Up to now, we have made some shy approaches: individual teaching for frequent users, demonstration of new products, etc.

For the coming academic year, October 1993-June 1994 our schedule is more accurate.

- Edition of Guides of use for every CD-ROM database
- Courses (4 hours) to groups no more than 10 users. The courses will be held out of the library in a class equipped with all kind of audiovisual aids that would help with the method. We will teach an introductory course or two for every database. We will conduct a simple search, step by step, and users will be able to follow the search through a big common screen, being able to participate in the search at any time.
- Commercial demonstrations of new products for any kind of users: Librarians, teachers, librarianship students...

### **Training librarians to be trainers**

Our university is a new university and there are so many things to do. But continuous training is one of our university goals. At the library we try to specialize librarians in its own field, with special attention to new technologies. At the library work 9 professional librarians and up to 25 paraprofessionals and scholarship holders. Training professional or paraprofessionals to be trainers of end user, in general, and CD-ROM end users is vital for us.

Our plan will be to develop a computer aided training package that could be useful even for end users in the long range time.

This package would have this four key design criteria:

- Modularisation
- Navigation
- Representation
- Interaction

**MODULARISATION**, that is reducing a whole into a series of smaller sections or modules will focused the learning experience and progress will become easier to monitor. This kind of package must be capable of adaption to individual circumstances.

**NAVIGATION**. Through hypermedia systems will have the advantage of being a non serial approach that enables users to create their own links between subjects and follow pathways of particular interest.

**REPRESENTATION.** Means the integration of moving images, still graphics, colour, sound, text, etc.

**INTERACTION.** Is essential when we talk about multimedia. We are not talking of total freedom of response at certain points and to see the effects of these responses. We talk about a limited number of defined choices which are intended to reduce the infinite variety of situations to a optimum number of generic possibilities. Careful design of these choices and the results, will hopefully ensure that key points are learnt by the trainee.

Next step will be to make these tool available to end users after some kind of adaptation to their real needs.

### **Conclusion**

Libraries only get their real meaning through a strong interaction with users. Is our task to improve their knowledge about how to use new tools in the information process. But, first of all, we have to teach them how to be self searchers. Librarians should be around without being noticed by the users, only their professionality should show between tools, information and users. There is a long way to go in this direction and technology goes much faster than we never expected, so our updating must follow the same rythm of innovation.

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# ALTERNATIVES TO CD-ROM: ISSUES AND PROSPECTS<sup>1</sup>

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 completed<sup>2</sup>. 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 alone<sup>3</sup>.

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 sharing<sup>4</sup>.

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 institutions<sup>5</sup>. 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 editions<sup>6</sup>.

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 file<sup>7</sup>. 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 online<sup>8</sup>. 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 another<sup>9</sup>. 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 idiosyncrasies<sup>10</sup>.

## **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 addictive<sup>11</sup>."

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 database<sup>12</sup>. 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 assistance<sup>13</sup>.

### 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 engine<sup>14</sup>. 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 page<sup>15</sup>.

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 medium<sup>16</sup>.

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 Tennyson<sup>17</sup>

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.

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## LE DISQUE COMPACT DANS LA FRANCOPHONIE DU SUD

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**Abstract:** Recent statistics indicate that the telecommunications networks in Francophone developing countries prove to be barriers instead of facilitators to the flow of information (prohibited tariffs, lack of equipment, electricity problems, interconnexion to international nodes, etc.) The CD-ROM technology offers a modern answer to the information needs of all types of institutions and their users. Furthermore, it is proven that developing Francophone countries could become avid CD-ROM producers in the coming years.

Dès la mise en place de ses programmes, la Banque internationale d'information sur les États francophones (BIEF) s'est engagée à diffuser ses produits vers le Sud "sur des supports facilement transportables" pour répondre aux directives de la Conférence des chefs d'État et de Gouvernement des pays ayant en commun l'usage du français (Sommet francophone) tout en respectant la compatibilité des infrastructures informatiques et télématiques du Sud. Afin de choisir pertinemment les supports de diffusion de sa banque de données bibliographiques, la BIEF a retenu, dès juin 1987, les services d'un groupe de 7 experts du Sud qui s'est vu confier la responsabilité d'inventorier les infrastructures d'accueil informatiques et télématiques des États membres. Les rapports des experts qui ont alimenté la rédaction de la première édition en 1989 des Profils géo-documentaires des États francophones exposaient les difficultés inhérentes aux infrastructures techniques de communication de même que les conséquences d'une tarification télématique prohibitive qui s'avère une barrière économique aux mouvements de l'information sur l'axe Sud/Nord de même que sur l'axe Sud/Sud. C'est ainsi que le support micrographique a été privilégié dès 1987 par la BIEF et qu'en 1991, les bases de données, bibliographiques et en texte intégral, ont fait leur apparition sur disque compact, la télématique étant toujours considérée peu accessible pour les raisons déjà énumérées.

Aujourd'hui comme hier, les statistiques répètent des faits et insistent sur des disparités étonnantes qui ne s'estompent pas. Les données qui suivent ne sont que des exemples. En Afrique noire on compte 2 téléphones par 1000 habitants; par contre, la seule ville de Tokyo, avec une population de plus de 8 millions, possède



plus de téléphones que l'ensemble des pays de l'Afrique subsaharienne. Une autre information en provenance de l'Union internationale des télécommunications (UIT) qui publie les taux des télécommunications indique qu'en Afrique, les tarifs sont toujours 2 fois, sinon 3 fois, le tarif américain ou européen. L'UIT insiste, par la même occasion, sur la désuétude des installations tout en essayant, dans le même foulée de convaincre les États mieux nantis de contribuer au financement du développement d'infrastructures modernes dans les pays en développement. La situation est telle qu'il devient inutile d'insister plus avant sur la présence de certaines prémisses essentielles liées à la disponibilité d'appareils téléphoniques et de lignes internationales surtout lorsque les bibliothèques et les usagers de services de banques de données en ligne souhaitent accéder à des informations distribuées par des serveurs éloignés.

Il est impératif que les plans nationaux de développement des pays de la Francophonie du Sud incluent, pour des raisons économiques évidentes, une politique d'information soutenue, entre autres, par une configuration performante d'un réseau national de communication faisant appel à des techniques informatiques et télématiques modernes soutenant le maillage de réseaux nationaux d'information sur des circuits domestiques et l'interconnexion aux grands réseaux internationaux. De nombreuses études effectuées par les grandes organisations internationales dont l'Unesco, soulignent certains développements dont l'introduction, de plus en plus rapide et de plus en plus fréquente dans les pays d'Afrique notamment en Afrique francophone, de technologies facilitant la transmission de données par paquets. L'introduction du protocole X25, dans plusieurs pays d'Afrique francophone par exemple, soutend la mise en place d'un véritable réseau opérationnel d'échange d'informations entre les institutions isolées. Il est évident que l'on assiste actuellement à une planétarisation des flux d'informations où l'informatique et les télécommunications, donc la télématique, joue un rôle essentiel. Le Programme intergouvernemental d'informatique (PII) de l'Unesco travaille activement avec ses partenaires du Sud à l'établissement d'un réseau informatique pour l'Afrique.

Suite aux recommandations de la Réunion d'experts sur le CD-ROM organisée par le PGI de l'Unesco et l'IFLA, à La Haye aux Pays-Bas, en juillet 1991, le professeur Gilles Deschatelets de l'École de bibliothéconomie et des sciences de l'information (EBSI) de l'Université de Montréal, a été retenu par le Programme général d'information de l'Unesco pour diriger une étude dont les objectifs sont (1) d'inventorier les infrastructures et les ressources en produits CD-ROM dans les pays en développement, (2) de préparer une base de données des organismes-sites et des personnes-ressources utilisant des produits CD-ROM dans les pays du Sud et (3) de préparer une base de données des organismes-facilitateurs qui éditent,

distribuent ou financent des produits CD-ROM dans et pour les pays en développement. Il est fort probable que l'étude indiquera l'avance des pays de la Francophonie du Sud dans ce domaine; ceci est le résultat des investissements et de la politique de renforcement des infrastructures documentaires de la Francophonie multilatérale réalisée par le biais du programme de l'Agence de coopération culturelle et technique (ACCT) qu'est la BIEF. Entretemps, il n'en demeure pas moins que la situation télématique dans le Sud demeure toujours difficile.

En 1986, la BIEF avait reçu le double mandat de dresser l'inventaire des informations bibliographiques concernant les États membres de la Francophonie et de leur restituer ces informations sur des supports facilement transportables.

Pour contourner le problème télématique, il fut décidé de diffuser la base de données bibliographiques sur microfiches et de fournir l'appareil de lecture aux unités documentaires qui n'en possédaient pas, tout en étudiant rapidement la rentabilité de transposer cette base de données et d'autres fichiers jusqu'alors diffusés uniquement sur imprimé, sur disque compact.

Il importe de saisir les finalités du grand catalogue multilatéral demandé par la Francophonie en faveur de ses États du Sud pour savoir qu'il est du mandat principal de la BIEF d'appuyer la création et la mise à niveau des catalogues nationaux et d'assister la production de bibliographies nationales rétrospectives et courantes. Ces activités sont d'ailleurs enchâssées dans les objectifs principaux de l'Agence de coopération culturelle et technique (ACCT), plus précisément au chapitre de l'appui aux structures documentaires du Sud.

La base de données bibliographiques sur microfiches est complétée, encore aujourd'hui sur demande, par la production de notices bibliographiques sur fiches cartonnées pour intercalation au fichier national d'un État. Un travail ponctuel d'extraction de notices bibliographiques, soit par téléchargement à partir du disque compact ou encore selon des méthodes plus traditionnelles consistant à extraire des notices à partir de microfiches par exemple, contribue à la mise à jour des bibliographies nationales. Une opération de reconstitution des fonds nationaux est rendue possible grâce aux localisations accompagnant chaque notice et à l'engagement des pays du Nord envers le Sud en vue de favoriser la reproduction de documents primaires sur des supports compatibles.

L'introduction du disque compact dans les systèmes de la BIEF a permis non seulement de moderniser la gamme de services déployés à l'intention des partenaires du Sud, mais de les associer à la production de bases de données utilisant de nouvelles technologies. Le Sud a d'ailleurs été associé dès le début du

processus; la BIEF mettait sur pied, en octobre 1990, un groupe de travail ad hoc sur le développement d'un disque compact principalement pour sa base de données bibliographiques. Ce Comité comptait des représentants du Nord, du Sud, des organisations gouvernementales dont l'ACCT et l'Unesco. Cette initiation à un nouveau support médiatique a aussi pour effet de stimuler les experts du Sud non seulement à utiliser le support disque compact pour obtenir et dériver de l'information, mais aussi à exploiter ce support pour la conservation d'information et de documentation, notamment dans le domaine spécifique de la préservation de documents de bibliothèques et d'archives.

La BIEF a créé la collection CDthèque Francophonie et ensuite, elle a introduit des programmes de formation non seulement à la spécificité de ses banques de données, mais à la globalité des possibilités offertes par le support disque compact. Un de ces ateliers de formation se tenait, en mai 1992, à l'École internationale de Bordeaux; une vingtaine d'experts de la Francophonie du Sud ont bénéficié d'une formation déployée à leur intention grâce à une collaboration entre le PGI et la BIEF.

Quant à la CDthèque Francophonie, elle se définit comme un ensemble de fichiers spécialisés produits par les partenaires des réseaux BIEF. La volume 1 de cette collection dont la deuxième édition date de septembre 1992, comprend le premier et unique grand catalogue bibliographique collectif signalétique multilatéral des pays francophones (environ 28000 notices), le Répertoire des codes de localisation assurant la fourniture des documents, les Profils géo-documentaires du Sud, tableau signalétique des situations documentaires, informatiques et télématiques des pays du Sud membres de la Francophonie et le Fichier des sigles et des acronymes en usage dans la Francophonie (1900 entrées).

La base de données bibliographiques est un fichier source; la qualité des notices bibliographiques est validée en fonction du téléchargement direct dans des fichiers nationaux informatisés de notices identifiées selon des besoins liés à la constitution et à la mise à niveau des fichiers nationaux et des bibliographies nationales des États membres. Cette base de données est axée aussi sur le rapatriement du patrimoine national et elle contribue à optimiser l'exploitation des fonds documentaires existants en favorisant entre autres les activités d'échange et de partage des ressources documentaires, par le prêt entre bibliothèques Sud/Sud grâce aux codes de localisation des documents, encourageant ainsi la constitution de réseaux locaux tant informels et qu'officiels.

En fournissant aux établissements du Sud le lecteur de disques compacts nécessaire à l'utilisation de la CDthèque Francophonie, comme elle l'a fait dans le cas des lecteurs micrographiques pour la base de données sur microfiches, la BIEF

encourage aussi ces établissements à acquérir des collections sur CD-ROM et à les exploiter au bénéfice de leurs usagers. La formation aux CD-ROM est donc de ceux types: pour les catalographes et les gestionnaires de catalogues nationaux et de bibliographies nationales en fonction de la gestion des fonds nationaux et pour les professionnels de l'exploitation des collections en fonction des besoins des utilisateurs. Pour faciliter l'atteinte de ce deuxième objectif, la BIEF a mis au point un programme d'abonnement aux périodiques et aux répertoires (supports imprimé et disque compact) que l'on appelle dans notre jargon "Programme de participation 50/50" par lequel la BIEF rembourse sur présentation de factures officielles, 50% des coûts d'abonnements à des périodiques sur support imprimé ou CD et à des banques de données sur CD.

Il est évident que la littérature scientifique et technique en langue anglaise est actuellement la plus prolifique surtout sur support CD. Bien que la BIEF déplore cet état de choses, il n'est pas question de limiter de quelque façon que ce soit l'accès libre à l'information dans quelque langue que ce soit pour nos partenaires, car la BIEF aurait crainte en agissant autrement de contribuer à la création de ghettos documentaires. Il convient cependant pour la Francophonie, d'agir, non pas à contre courant dans cette situation, mais de développer des stratégies de diffusion de l'information produite par ces chercheurs en langue française en créant des réseaux similaires et complémentaires de diffusion de littérature surtout dans les domaines scientifiques et techniques. C'est ainsi que la BIEF a convenu avec le Programme général d'information (PGI) de l'Unesco de l'identification d'un site en Afrique francophone dans le cadre du programme de diffusion de littérature scientifique et technique en texte intégral sur CD-ROM et qu'elle encourage les bibliothèques de son réseau à profiter des offres liées à la diffusion d'information scientifique et technique sur CD proposées par des sociétés et des organisations comme le American Association for the Advancement of Science (AAAS).

Il est fort souhaité que les bibliothèques et centres de documentation du Sud mettent à profit toutes les possibilités de se doter de lecteurs de disques compacts et de banques de données (bibliographiques, en texte intégral, etc.) afin d'élargir les bassins documentaires qui sont à leur disposition et de contribuer ainsi à la réduction des barrières techniques et économiques qui freinent et gênent la circulation de l'information et qui entretiennent le sous-développement dans toutes ses expressions.

Il est prouvé du moins au sein de nos réseaux francophones que l'accès aux bases de données dans les bibliothèques contribue à l'exploitation maximale des fonds documentaires. Les données produites par le signalement et le dépouillement des

périodiques sont accessibles par l'indexation de sorte que les ressources souvent limitées ou confinées dans des régions ou encore dans des institutions fermées et exclusivement réservées à des élites se démocratisent en devenant, comme par magie, disponibles à des publics plus larges et aussi plus hétéroclites. Les utilisateurs en arrivent donc à exploiter efficacement les ressources documentaires et bibliographiques qui sont déjà à leur portée et dont ils ignoraient le potentiel réel. L'exploitation optimale de ces ressources est rendue possible par l'accès de type "index" que constituent les bases de données. La mise en valeur des collections existantes est rendue possible par l'intermédiaire des grands services d'indexation; et cet accès, toujours difficile par la télématique, est facilité par l'autonomie offerte par la technologie du disque compact. Des collections statiques se dynamisent, les fonds sont exploités et la fréquentation des bibliothèques est à la hausse et évidemment le degré de satisfaction des utilisateurs s'en ressent.

Alors que les barrières techniques et économiques imposées par la télématique et l'accès en direct aux bases de données étrangères n'ont pas permis aux grandes collections du Sud d'être dynamisées par cette forme d'accès, voilà que le disque compact apporte des solutions et surtout des clés d'accès.

À Dakar, par exemple, la bibliothèque de l'Université Cheikh Anta Diop, qui participe aux programmes de la BIEF, est abonnée à une collection fort imposante de banques de données sur CD ce qui lui permet de satisfaire les besoins ponctuels de ses utilisateurs qui découvrent le potentiel documentaire jusque là caché des collections de l'Université. Le contenu des périodiques jusqu'à maintenant non indexé le devient magiquement par l'intermédiaire des bases de données sur CD. La rentabilité des collections est donc augmentée proportionnellement au volume d'utilisation des ouvrages par les utilisateurs. La réputation de ce service déborde les frontières sénégalaises de sorte que depuis plusieurs mois déjà la bibliothèque universitaire, qui est aussi le Centre serveur régional BIEF, est sollicitée par des institutions étrangères africaines qui ont pris connaissance de l'existence de ce service de bases de données et qui souhaitent s'y raccorder pour le bénéfice de leurs clientèles immédiates. C'est ainsi que naissent les réseaux de partage; la BIEF a aussi épiqué son centre serveur régional, tout comme les 17 autres, d'un télécopieur ce qui lui donne toutes les facilités pour transmettre, à des partenaires ayant les mêmes technologies, des articles de périodiques par exemple, sans pour autant priver ses propres clientèles des documents qui autrement auraient fait l'objet d'une transaction de prêt entre bibliothèques internationale. Il est facile de comprendre que le support disque compact donne accès à des informations qui ne seraient autrement disponibles que par le biais fort peu rentable de la télématique.

Ce qui se profile dans un horizon for peu éloigné, du moins en Francophonie du Sud, concerne la création de bases de données nationales et de banques de données spécialisées sur disques compacts. Les premiers catalogues nationaux sur CD verront le jour en Côte-d'Ivoire, à Maurice, au Mali et dans la Caraïbe au cours des prochains mois; les travaux sont déjà amorcés en ce sens. À partir d'extractions de notices bibliographiques de la base de données de la BIEF, des téléchargements vers des fichiers informatisés sont en cours; afin de protéger les catalogues nationaux d'une part et d'autre part de favoriser leur diffusion auprès de bibliothèques nationales étrangères, ces fichiers nationaux seront transposés, à la demande des autorités professionnelles et gouvernementales, sur disques compacts. En vue d'une action intégrée de rapatriement des fonds nationaux auprès des bibliothèques nationales, une action de conversation et de diffusion des thèses est en cours de réalisation assurant non seulement le recensement des thèses, leur saisie en texte intégral sur disque compact, mais surtout leur conservation et leur exploitation par les chercheurs de divers milieux dont les bibliothèques et les gouvernements. Et enfin, la BIEF étudie les possibilités de transposer sur disques compacts des bases de données africaines dont la diffusion serait optimisée par l'utilisation de ce support. Des négociations sont actuellement en cours avec des organisations gouvernementales nationales et internationales. Ces bases de données trouveront naturellement leur place au sein de la collection CDthèque Francophonie. À la demande de la Fédération des bibliothécaires, archivistes, documentalistes ces États membres de la Francophonie (FABADEF), la BIEF poursuit auprès des associations nationales d'archivistes, de bibliothécaires, de documentalistes et de muséographes des négociations visant la transposition, en texte intégral, sur CD de leurs bulletins professionnels; les associations nationales du Sud ont demandé cette intervention de la BIEF pour assurer la préservation de ces documents et encourager la diffusion et la promotion de la recherche dans le domaine de l'information documentaire et technique (IDT).

La BIEF évalue aussi les potentialités d'établissement d'un laboratoire de pressage de disques compacts dans le Sud.

L'efficacité et la rentabilité du support disque compact dans la Francophonie du Sud, et par extension dans l'ensemble des pays en développement, sont réels. Des analyses scientifiques réalistes permettent d'assurer un monitoring sérieux de l'évolution des environnements documentaires modifiés par l'introduction de ce médium qui, il est important de le souligner, est complémentaire à l'utilisation d'autres supports allant de l'imprimé à la télématique (lorsque l'infrastructure s'y prête) en passant par les microformes. L'accès, en mode autonome et local, aux informations bibliographiques et documentaires stockées dans les bases de données sur CD a comme conséquence directe l'optimisation réelle de

l'exploitation des collections dans les unités documentaires du Sud, car la base de données sur CD se transforme en index de ces collections qui autrement demeureraient sagement logées sur les étrangères des bibliothèques; ces collections dormantes s'éveillent pour le bénéfice des utilisateurs. Cette technologie du disque compact favorise l'utilisation maximale et économique des fonds documentaires et contribue aussi à réduire les barrières érigées par la tarification télématique qui demeure prohibitive dans la majorité des pays du Sud. On est donc en mesure de reconnaître une valeur rajoutée à l'investissement consenti pour le développement des collections dans le Sud, car la rentabilité économique de l'information est directement proportionnelle à la fréquence de son utilisation et au volume des transactions qu'elle engendre par sa mise en réseau tant au niveau national que régional et international.

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