

Concurrent session 6A

CD-ROM II

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INFORMATION RETRIEVAL ON CD-ROM AND END-USERS

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The introduction of compact disk technology in biomedical libraries with fixed costs and unlimited access to available databases or to full primary documents is not wanting of great hardware and software requirements. The National Library of Medicine in Washington has allowed for several dealers to supply information covering the past six years in compact disks and it is mainly from their bibliographic task that we usually profit, either through Index Medicus or MEDLINE. This new documentary support is also available as reference tool which can be consulted directly by the end-users with no help from a staff member.

Here we have evaluated the impressions gathered over 31 days of non-mediated end-user searches with a CORE MEDLINE/EBSCO pilot disk (January 1986 — March 1988)

Aims

The primary purpose of our trial was to evaluate whether MEDLINE on CD-ROM allows the performance of non-mediated searches without help from the librarian or documentalist, or at most with minimal intervention.

Initially we raised the question of what type of assistance or training the users of our libraries would require and how this would affect the organization of our services and the staff's work. Furthermore, we were interested in watching the first spontaneous reaction of the users. Finally, we wanted to compare our results to those of other trials of the sort from the great amount of literature revised, mainly North American.

The library

Bellvitge Hospital's Library serves a general hospital of over one thousand beds located in an overcrowded area of the outskirts of Barcelona. It belongs to the autonomic administration and is in agreement with the University of Barcelona. As a matter of fact, it embodies the last four years of Medical School of the University of Barcelona, a University School of Nursing the Faculty of Dentistry, a School of Stomatology, which is now practically closed, and a School of Podology. Both the School of Nursing and the Faculty of Dentistry have their own libraries, but they are not coordinated with the hospital's library.

The hospital library was started in 1974. Presently it holds subscriptions to almost 200 publications on medicine and hospital subjects and 2250 volumes, only one librarian and the only online information retrieval service in the hospital.

Most of the users are physicians and, during the academic year it is frequently visited by consulting students.

#### Methods

The product tested for trial, a CORE MEDLINE/EBSCO CD-ROM pilot disk, contained information covering the period between January 1986 and March 1988 from a selection of an approximate 400 journals.

The EBSCO software is not meant to imitate the online systems. It runs by menu options. Search involves using a fill-in-the-blanks technique on a query profile. There are well designed tutorial and help screens. Search terms are highlighted. It is possible to display five different bibliographic formats and use boolean operators, right truncations, word proximity, and wild-cards. Patrons can browse MeSH alphabetically or hierarchically. Another outstanding feature of this software occurs when user security is activated: user access to compact disk is restricted by the user identification, the password and the menu set established in the users file. The users file assigns different levels of access to the system from level 1 for basic search to level 6 for library administration.

In our trial we used a 640Kbytes RAM HEWLETT PACKARD VECTRA ES, a monochrome display monitor and a HITACHI 1503S CD-ROM reader. The workstation was placed close to the staff area and librarian.

August 1988 was established as a testing period. We announced it by sending out information sheets and we placed a sign in direct sight of everyone entering the library. Usual users were simply invited. However, one of the most effective ways of promotion was word of mouth. We do not charge any kind of fee for the use of this source, service or product, and we have no intention of doing so. The compact disk was not handled by library patrons. Everybody received the same introduction to the capacity and applications of the disk and then they were given a small three page guide. We decided to write out a brief memo as a learning aid for our users since we were set upon performing our trial in a way that they should require as little guidance as possible from the library staff. This would allow for a better evaluation of their reaction to the software and enable its intro--

duction without harming other library services. Our guide included the strictly necessary instructions to perform three basic operations: access, search and visualizing results. No instructions were given as to how to store or print searches. The memo included a reproduction of the data entering screen with an explanation for each option: word search in any fields of the database, MeSH descriptors, words featuring in the title field, authors,... Instructions for search visualization included those for the selection of the desired format. An annex listed the various ways of entering keywords: truncation, word proximity, phrases, hyphen, each with several examples. At the end of each session, users filled in the following questionnaire:

1. Is the system easy to use?
2. Have you ever used an online service?
3. Have you ever used a microcomputer?
4. Did you save time using MIDLINE on CD-ROM?
5. Did you retrieve relevant references?
6. Please cross out the system you used to learn how to handle a disk:
  - LIBRARIAN'S HELP
  - TRIAL AND ERROR
  - GUIDE
  - HELP FUNCTION ON SCREENS
  - A FRIEND
7. Is it easy to learn how to handle the system?
8. Will you use it again?
9. Further comments

### Results

The questionnaire was answered by 62 physicians, usual library users who had directly experienced the disk.

We found the following results remarkable: 94% of the users agreed that the system was easy to use; 96% considered that it was easy to learn how to handle it; 79% admitted to have previously used a microcomputer. As a matter of fact it has been observed that in non-mediated searches of users that previously handled computers, the librarian's help was significantly lower than to those with no previous experience. Furthermore, patrons with a basic knowledge of computer handling and who know some programs contributed suggestions to improve the software. However, for those who occasionally use teledocumentation(47%), this did not imply being more familiar with CD-ROM. This is probably so because in online information retrieval, the user is not di-

rectly exposed. On the other hand, these users recognize bibliographic formats more easily and have a subject indexing background.

The human condition and training of physicians as well as their fondness or utter dislike of computers had an influence on the development of an optimal non-mediated search to a degree that goes beyond the purposes of this paper. We have seen that 96% of users admitted that it was easy to learn how to work with the disk, and that 100% say they would use it again, including those cases (19%) where no relevant references were obtained. This 19% failure index was basically due to the limitations of the disk rather than a disappointment in relation to this new system.

The sixth question showed unexpected results: 94% of users answered that they required the librarian's help to learn how to use the system; 25% crossed out "trial and error" and only 19% used the guide. The options "help function on screens" and "a friend", were not significant (6%). Furthermore in many cases the users who admitted help only from the librarian for their non-mediated searches, in some occasions exclusively used the guide. We have explained this anomaly as a compliment directed at the librarian or as a biased means of support towards the project or campaign. It is beyond our knowledge to estimate whether the order of options given in the questionnaire were accidentally biased as well.

The problems that most frequently required the librarian's assistance were those related to the comprehension of the movements in the menu and those related to retrieval of proper registers through also proper keywords.

We believe that the maximal interest of any questionnaire depends on whether it includes results comparable to other similar experiences. Some of the bibliography used for our trial gathers the evaluation of results of several trials using questionnaires similar to the one we have used. The answers are also similar, although they do not always mention the number of users included in their studies. All authors agree on how favourably and even enthusiastically users welcome this new bibliographic source. However, it is also worth mentioning that satisfaction is not always bound to the efficacy of the results obtained by the users due to a scarce knowledge of documental techniques (6). Workstations are usually placed near the reference services or near the Index Medicus or online information retrieval services. The problem users must face when handling the CD-ROM are coped with by the reference staff or by staff appointed to that purpose, in some cases student

assistants. The greatest difficulties are found in users with no experience in the use of computers (19, 20). Glitz (6) reports that with the help of an instruction manual designed at UCLA Biomedical Library, users did not require too much assistance from the reference service. Silver (20) noticed a 20% increase of questions to the reference service about the CD-ROM. In all cases users were given some type of guidelines beforehand. Instruction manuals were written (6) and instructions were provided by trained staff who taught how to handle the compact disk from 5 to 15m (21) or from 15 to 20m (16) and initiation courses were organized.

### Discussion

The energy and time spent to introduce the CD-ROM in the library have obtained a highly positive response. The enthusiasm of users has outgrown all expectations. While the campaign has led to an increased workload in the library, the experience has not proved harmful. As a matter of fact it has given it a new dynamic outlook and has attracted new users who formerly abhorred consulting printed indexes or paying for online bibliography. It is not necessary to organize small initiation courses aimed at training our users specially in basic indexing concepts which can be applied to all kinds of reference sources. The main handicap is the generalized lack of computer knowledge, and this cannot be approached affectively unless the unexperienced users are strongly encouraged to take training and by avoiding the everlasting image of an overprotective and obstinate librarian.

It was not among our aims to establish the suitability of CD technology versus the online searches. However, we may say that to a certain extent they may be considered as two complementary sources. The compact disk can even help to prepare or simulate online searches that can later be executed, thus saving connection time.

Libraries should not undertake any innovation definitely no matter how fascinating it may seem. Neither should they plunge into a library "arms race" without keeping a critical mind.

Furthermore, we believe that the electronic editorial industry will have to standardize and improve their softwares.

Finally, we wonder if in Spain we shall ever be able to profit from our own CD industry. This would prove highly desirable to the Spanish librarians gathered here in Bologna and to those who were unable to attend.

BIBLIOGRAPHY

1. ARNOLD, Stephen. Electronic information on CD —a product or a service?. Online. 1987 ; 11(6) : 56-60
2. PRISTON, Ann. Reference sources on CD-ROM at Indiana University. The Electronic Library. 1988 , 6(1) : 24-29
3. BROERING, Naomi C.;LARSON, Robert H.;BAGDOYAN,Helen E. An enhanced mini-MEDLINE system TM : abstracts, more journals and CD-ROM. Serials Review. 1986 , 12(2/3) : 33-39
4. CONNOLLY, Bruce. Looking backward -CDROM and the Academic Library of the future. Online. 1987 ; 11(3) : 56-61
5. FENICHEL, Carol Hausen. CD-ROM —d'jà vu... or voilà?. Database. 1987 ; 10(6) : 6-8
6. GLITZ, Beşyl. Testing the new technology : Medline on CD-ROM in an Academic Health Sciences Library. Special Libraries. 1988 ; 79(1) : 28-33
7. HELGERSON, Linda W. CD-ROM search and retrieval software : the requirements and realities. Library Hi Tech. 1986 ; 4(2) : 69-77
8. KEMP, Richard. Compact Cambridge-Medline : a review of the Medline CD-ROM Electronic and Optical Publishing Review. 1987 ; 7(1) : 26-29
9. KURDILA, Edward M.;HARRIS, Kenneth C. CD-ROMance : an overview of Compact Disc Read Only Memory. IFLA Journal. 1988 ; 14(1) : 13-19
10. LELOUPE, Catherine. Mémoires optiques : pour y voir plus clair... Documentaliste. 1987 ; 24(3) : 109-113
11. LITTLEJHON, Alice C.;PARKER, Joan M. Compact Disks in an academic Library Laserdisk professional. 1988 ; 1(1) : 36-43
12. LLORET, Montserrat;ALÓS-MONER, Adela d'. Els disc òptics. Item. 1987 ; 24(3) : 109-113
13. MELLENDEZ, Vicenç. Nuevos desarrollos técnicos en recuperación de la información y sus posibilidades de implantación en el sector biomédico. Primeras Jornadas de Información y Documentación Biomédica (Santander : Hospital Marqués de Valdecilla, 1986) : 43-56
14. MEYER, Rick R. Customer experience with Dialog Ondisc. Laserdisk professional. 1988 ; 1(1) : 62-65
15. MULLAN,N.A.;BLICK,A.R. Initial experiences of untrained end-users with a life sciences CD-ROM database. Journal of Information Science. 1987 ; 13: 139-141
16. PEARCE, Karla J. CD-ROM : caveat emptor. Library Journal. 1988 , 113(2) : 37-38
17. PETERS,Charles.Databases on CD-ROM.The Electronic Library. 1987 ; 5(3) : 154-160
18. SILVER, Howard,"Supporting CD-ROM users and its effect on library services", Proceedings of Optical Publishing and Storage '87 (New York : Learned Information, 1987) : 151-154
19. SILVER, Howard. Managing a CDROM installation... Online. 1988 ;12(2) :61-66
20. STEWART, Linda.Picking CDROMs for public use.Am Libr. 1987;18(9):69-77
21. TENNENHOUSE,Michael. Medline on CD-ROM at the University of Manitoba Medical Library. Bibliotheca Medica Canadiana. 1987 ; 8(4) : 209-211
22. TENOPIR, Carol. CD-ROM Database update. Library Journal. 1986 : 70-71
23. WERTZ, Richard K. CD-ROM : a new advance in medical information retrieval JAMA. 1986 ; 256(24) : 3376-3378
24. WIGTON, Robert S. The new knowledge bases : CD-ROM and Medicine. M. D. Computing. 1987 ; 4(3) : 34-38

## MEDLINE ON CD-ROM: A COMPARISON OF SEVERAL VERSIONS

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CD-ROM as a medium in the supply of information has expanded greatly of late. In many libraries the silver disc now holds a firm place. A great many medical libraries have Index Medicus in their collection, the indexing journal published by the National Library of Medicine. Next to this the online available version of Index Medicus, Medline, is widely consulted. At the moment a discussion is going on whether Index Medicus should be supplemented with or even replaced by a CD version of Medline. Medline on CD-ROM undoubtedly offers certain advantages. It does not take up more space and it may partly replace the online consultation of this database. The great number of versions at present available offer a big problem when taking a decision to buy. The Biomedical working-group of VOGIN has started a comparative investigation of these Medline CD-ROM versions. The following versions were tested during Spring 1988: Ebsco, Cambridge Scientific Abstracts, Silver Platter, BRS, Dialog and Digital Bibliomed.

The following items will be compared: size, completeness, liability to interference, MESH and index presentation and implementation, searching possibilities, output options and prices. At the moment of writing this (March 1988) the testing criteria have been agreed upon, and the first Medline CD-ROM versions are being investigated. The tests will not only have to indicate which version is the easiest to operate but also which version is most suitable for a certain type of library.

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## Survey of the attitude in medical libraries towards CD-ROM as an information source

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### Introduction

New products and technologies have tried with different rates of success to penetrate in the library and information environment. Photocopiers, automated library systems and telefax apparatus seem to have established themselves among the books and journals.

Their aim is document retrieval and document delivery from the collection locally available. Document retrieval from extramural collections by means of new technologies, seems to be far less common. Of all medical libraries in The Netherlands, about 28% offer online services directly to their users. However, where about 7% of all libraries in The Netherlands have a medical orientation they count for about 16% of all electronically transferred Interlibrary Loan Requests (Ref. 1).

With the aim to comprehend the attitude among medical libraries in The Netherlands towards document retrieval systems aimed at literature not exclusively available from the local collection, questionnaires were sent to all 193 medical libraries in The Netherlands. A total of 81 (42%) were returned in time to be included in this survey. In addition, about 200 questionnaires were given to about 10 test sites of a sub-set of the MEDLINE database on CD-ROM in The Netherlands with the goal to comprehend user experiences. Only about 14% of these were returned in time to be included in this survey, and therefore the decision was made not to include these results in this survey.

### Medical libraries and their print media collections

Whereas the industrial society can be characterized by the mass production of goods, compared with the preceding agricultural society, the current post-industrial society can be characterized by the mass production of information (Ref. 2). Until 1961, a total of 50,000 scientific periodicals have been launched with the aim to offer a distribution channel for a world total of about 6,000,000 scientific papers. The number of papers increases at the approximate rate of at least half a million a year (Ref. 3).

Due to rapidly increasing subscription prices the consumer base for scientific publications nowadays mainly consists of institutional subscribers. Of the 2,600 libraries and documentation centres in The Netherlands, a total of 193 (7,42%) have a medical orientation (Ref. 4).

The basis of the functionality of a medical library is its collection of information materials, and still central to that collection is print media, whereas automated information retrieval helps the physician to locate the minority of articles which are of personal interest, from an ever increasing mass of published information, thereby intensifying the demand for information in the medical library (Ref. 5).

Based on data on the book collection of 184 libraries and the journal collection of 183 libraries, table 1 gives a quantitative impression of Dutch medical libraries.

Table 1: Quantitative characterisation of medical libraries in The Netherlands

	total	largest No. per library	smallest No. per library	median
number of libraries:	193			
volume of book collection:	2,971,791	350,000	350	5,000
volume of journal collection:	51,481	6,000	6	120
	<u>replacement volume*</u>			
	total	median	average price per item*	
book collection	202 million	339,150	67,83	
journal collection	4.4 million**	10,216**	85,13	

\* in US\$, based on 1987 prices (Ref. 5)

\*\* per annum

The term "medical library" does not describe a uniform group of facilities, for medical libraries vary greatly in size and nature of parent organisations, as can be seen from tables 1 and 2.

Table 2: Characterisation of the parent organisation to which the medical libraries belong

Nature of parent organisation:	% of responding libraries:
for-profit organisation/ industry	3.70%
university	25.93%
educational organisation/ non-university	13.58%
hospital/ nursing home	27.16%
other non-profit organisation	29.63%
	total = 100.00%

Of the libraries, 65,00% were the main library within the parent organisation, whereas 35,00% classified themselves as a departmental library.

Table 3: Availability of the various printed bibliographic tools in the responding libraries

Reference tool:	available in the given % of the libraries:*
Excerpta Medica (1 or more sections)	49.38%
Index Medicus	24.69%
Meyler's Side Effects of Drugs	22.22%
Cumulated Index Medicus	20.99%
Side Effects of Drugs Annuals (ed. M. Dukes)	13.58%
Biological Abstracts	4.94%
Abridged Index Medicus	0.00%

\* Multiple answers were possible

Of the other sources of medical/ toxicological information mentioned, only Current Contents with 8.64% was available in more than 3% of the responding libraries.

#### Online services in medical libraries

Following the introduction of computerised systems for the production of printed bibliographies, data in machine readable form has become available for (online) searching by means of text retrieval software. The total number of databases available for online searching has increased from 400 in 1979/80 to 3,369 in 1987 (Ref. 5).

As can be seen from the following table, at the moment about 28% of the medical libraries are offering online services directly to their patrons.

Table 4: Availability of online services in medical libraries

online services directly offered to the patrons	28.21%
online services offered via other department	23.08%
no online services offered	48.72%
total =	100.01%

The bottleneck in the penetration of online databases as a reference tool in the library environment, is the lacking of standards for hardware, query languages and search methods, a diffuse and continuously varying supply of machine readable information and a too limited knowledge and experience with computer applications on the working place in general (Ref. 7).

As can be seen from the following table, MEDLINE produced by the National Library of Medicine, is the most frequently used medical database, followed by EMBASE, produced by Elsevier.

Table 5: Most frequently used medical databases

database:	freq. used by the given % of respondents:*
MEDLINE/ MEDLARS	65.00%
EMBASE (Excerpta Medica database)	47.50%
Biosis Previews	12.50%
Toxline	15.00%
Int. Pharmaceutical Abstracts	2.50%
others	32.50%

\* multiple answers were possible

The same ranking of databases was found in the results of a survey of online usage in The Netherlands by VOGIN, the Dutch online user group over 1983 (Ref. 8).

As can be seen from the following table, DIMDI is by far the most used host organisation to access medical databases.

Table 6: Host organisations used to access medical databases

host organisation:	used by the given % of respondents:*
DIMDI	72.50%
Dialog	17.50%
Data-Star	17.50%
others	17.50%

\* multiple answers were possible.

A breakdown of the annual online expenditure of the responding libraries is given in the following table.

Table 7: Breakdown of annual online expenditure of the responding organisations

annual online expenditure in US\$:	percentage of responding libraries:
500	34.29%
500 - 1000	11.43%
1000 - 1500	5.71%
1500 - 2000	8.57%
2000 - 2500	8.57%
2500	<u>31.43%</u>
total =	100.00%

Based on these figures, 68.57% of the medical libraries using online systems have an annual online expenditure of US\$854.

Estimated from an average cost of US\$50 per online hour, the majority of libraries search about 17 hrs. per year or about 34 searches annually or 0.65 searches per week.

The results of the VOGIN survey during 1983 indicated that 75% of all online information specialists searched less than 6.4 queries per week (Ref. 7).

Whereas in the medical libraries printed bibliographies are in principle available at no extra cost for every visitor to the library: students, staff members and other interested persons from within or outside the organisation, 60.50% of the libraries pass the online charges, completely or partially on to other parties.

Table 8: Possibility to pass online charges on to other parties

	% of responding libraries:
yes	18.42%
yes, partly	26.32%
yes, to third parties only	15.79%
no	<u>39.47%</u>
total =	100.00%

The environment, as characterized by the collected data seems not to offer favourable opportunities to large user populations to benefit from the transition of data in printed form to data into machine readable form.

### Optical storage technology, CD-ROM

With the evolution from "dumb"-terminals to micro computers as text retrieval devices, userfriendly software, including colour displays and window techniques, has become available to function as front-end interface between the user and the host's retrieval software. CD-ROM offers the opportunity to store more than half a billion characters (550 MB) of data in digital (numeric) form on a disk which is physically identical to the 4 3/4" audio disks. However the storage capacity of the CD-ROM is equivalent to 275,000 pages of typed text, data compression and the exclusion of often-used words e.g. the, her, on, after etc. must be applied to store all, over 300,000 records, annually included in the MEDLINE database on a single disk, thus forcing the user to swap disks for a multiple years' search.

For the time being, multiple years' searching of the MEDLINE database on a single disk is only possible with a sub-set of the database.

The current penetration rate and market size estimation of CD-ROM in Dutch medical libraries is given in table 9.

Table 9: Current penetration of CD-ROM in Dutch medical libraries and their purchase intention

database(s) on CD-ROM available	8.64%
considering purchase of database on CD-ROM	23.46%
not considering purchase of database on CD-ROM	61.73%
no reply	6.17%
total =	100.00%

Based on sales figures, an estimation can be made that little more than half of all databases on CD-ROM purchased by the responding medical libraries were versions of the MEDLINE database. Almost all libraries who had purchased a database on CD-ROM used a Philips CD-ROM player. This could be the result of a subsidized project whereby about fifty libraries in The Netherlands could acquire a Philips CD-ROM player and a CD-ROM with sub-sets of databases produced in The Netherlands.

Table 10 shows that the responding librarians have an almost equally divided opinion about the influence of CD-ROM.

Table 10: Opinion about the influence of the CD-ROM version on the other versions of a reference work

no influence on the other versions	31.03%
will replace printed version	31.03%
will replace online version	37.93%
total =	100.00%

As the National Library of Medicine has leased its database to commercial bibliographic vendors like Dialog, DIMDI, Data-Star etc., universities like Georgetown University and medical centres like The Medical Information Centre at the Karolinska Institute, the same data on CD-ROM is offered by some 7 or more producers.

With the exception of those producers offering sub-sets of the MEDLINE database, all producers offer the same data. Therefore, discriminating factors in the process of buying a certain brand are features offered within the software, price and additional factors, such as relation with other (online) versions of the data included or other data offered with the same retrieval software etc.

A listing of the various features, offered by retrieval software in descending order of relevance, is given in the following table.

Table 11: Relative importance of various features as offered in the retrieval software

feature:	relevance in %:
author index	12.73%
alphabetical/ hierarchical thesaurus	11.95%
journal title index	11.12%
Interlibrary Loan option	10.63%
Boolean "and-or-not" operators	9.75%
local holding feature	9.22%
download facility	8.34%
save and recall options	8.19%
multiple print formats	7.02%
adjacency/ proximity operators	6.05%
explosion feature	5.02%

The high ranking of the Interlibrary Loan option on this list reflects the importance of linking document retrieval with document delivery.

### Conclusions

The basis of the functionality of a medical library is still its printed media collection. The replacement value of the median medical book collection is US\$339,150, whereas the median annual serials subscription expenditure is US\$10,216.

The most commonly used reference tool is one or more sections of Excerpta Medica, followed by Index Medicus. Only about 28% of the medical libraries offer online services directly to its patrons, the average annual expenditure for these services is US\$854 for about 69% of these libraries, which is 8.36% of their subscription expenditure. So far, only 8.64% of all libraries purchased a CD-ROM, whereas another 23.46% are considering the purchase. Based on a subscription price of about US\$1,000 for the current year of MEDLINE on CD-ROM and about US\$500 for the backfile years, an annual subscription to the current year and four backfile years would involve a relocation of about 30% of the medial subscription budget. Based on these figures, an estimation can be made that the first disks will be acquired by the larger libraries or by those libraries that managed to obtain additional funds for extending their services, followed by a drop in prices as a result of larger quantities moved enabling even more libraries to participate in the application of this new and challenging technology.

### References

1. Interlibrary Loan for medical libraries using the online Dutch union catalogue system Pica, The Netherlands.

2. Alexander King, President of the Club of Rome in his keynote speech at the opening of the 44th. Conference and Congress of the International Federation for Information and Documentation (FID) Aug. 28 - Sept. 1, 1988, Helsinki, Finland.
3. Derek J. De Solla Price, Little science, big science, 1963 Columbia University Press, ISBN 0-231-08562-1.
4. Nederlandse bibliotheek- en documentatiegids 1987/1989, Nederlands Bibliotheek en Lektuur Centrum, 's-Gravenhage, 1987.
5. Alfred N. Brandon and Dorothy R. Hill, Selected List of Books and Journals for the Small Medical Library, Bull Med. Libr. Assoc. 75(2) April 1987, 133-165.
6. Directory of Online Databases, Vol. 8, No. 1, 1987. Cuadra Associates and Elsevier Science Publishing Co. Inc.
7. P.B. Leuvink and J. Selfhout, Databank Publishing an evaluation of the applications for the subsidy "Databank Publishing 1983", (in Dutch) 1986, 's-Hertogenbosch, NEHEM.
8. Online in 1983 stabile growth, stabile phase (in Dutch), Login, 1986.

Concurrent session 6B

Microcomputers in libraries II

Chair

B. Aronson



THE MICROCOMPUTER AS A MULTIPLE-USE TOOL

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ABSTRACT

For medium size health libraries, microcomputers offer a large set of very attractive possibilities. This paper presents the functions which have been automated on PC by the Medical Library of the University of Louvain during the last 18 months :

1. wordprocessing and electronic recording of administrative data (mail, accountancy, statistics, etc.);
2. serials management with local check-in and online ordering and claiming;
3. automated "teleordering" of documents within the inter library lending framework :
  - the document request is keyed in by the librarian; then, the microcomputer
    - a. consults the BIOMED (union catalog of biomedical journals in Belgium);
    - b. automatically selects the library that holds the document &
    - c. forwards the requests by electronic mail (in Belgium and abroad);
  - statistics and invoicing of document orders;
4. online retrieval of bibliographical databases with downloading of selected references;
5. local use of bibliographical databases on CD-ROM by librarians and end-users;
6. electronic mail as a new and very efficient communication tool between libraries.

Other applications are expected to be automated during 1989:

1. online consultation of catalogues referring to the library's books and periodicals, through a local PC-network located in the lecture rooms and in the Faculty's departments,
2. online ordering of documents through the same local PC-network.

The Medical Library of the University of Louvain bought its two microcomputers for less than 4% of its annual acquisition budget; the softwares have been bought, received or written by its staff.

Conclusions

Considering their moderate cost and their extraordinary efficiency for libraries and their end-users, microcomputers represent today an ideal and essential tool. Finally, their co-ordinated introduction into European medical libraries would considerably improve their cooperation and services.

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### INTRODUCTION

Depuis moins de 10 ans, le succès foudroyant de la micro-informatique et le développement de la télématique ont littéralement transformé bon nombre de secteurs de notre société, depuis les entreprises jusqu'aux administrations et écoles. Les bibliothèques n'ont pas été insensibles à ce courant et pour la plupart d'entre elles, l'informatique est désormais devenu un outil de gestion courant.

Le fait que la microinformatique offre aujourd'hui la possibilité aux bibliothèques d'informatiser aisément leurs services peut s'expliquer par trois facteurs :

1. le coût des microordinateurs à partir de 1.700 \$ n'est plus prohibitif,
  2. les mémoires magnétiques des PC atteignent des capacités de stockage équivalentes à celles des gros équipements récents,
  3. la variété des "progiciels", c'est-à-dire les logiciels clés-sur-porte, disponibles sur le marché permet d'assurer quasi toutes les fonctions bibliothéconomiques courantes et ceci sans investissement de programmation "maison".
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Après avoir informatisé le catalogue de ses périodiques sur cartes perforées dès le début des années '70, la Bibliothèque de la Faculté de Médecine de l'Université de Louvain entreprit d'automatiser d'autres fonctions sur miniordinateur autonome en 1981. Il s'agissait entre autres du catalogue des livres et des périodiques, du prêt et de la facturation de différents services. Ces applications maison fonctionnent toujours parfaitement depuis 7 ans, mais le matériel est aujourd'hui éclipsé par les performances des microordinateurs. D'autre part, les frais de maintenance inévitables entraînés par notre miniordinateur correspondent à l'achat annuel de deux PC; voilà matière à réflexion.

Etant donné que le développement de nouvelles applications sur notre miniordinateur ne présentait dès lors plus autant d'intérêt, nous avons acquis notre premier PC en 1986. Celui-ci était destiné à l'interrogation en ligne de bases de données, à la gestion des périodiques, au courrier électronique et au traitement de textes. Très vite, l'utilisation intensive de ce PC par le personnel de la Bibliothèque et le besoin de lancer de nouvelles applications hâta la décision d'en acquérir d'autres. Micros et mini fonctionnent donc parallèlement aujourd'hui dans notre Bibliothèque, mais vraisemblablement des PS remplaceront bientôt notre ancien

mini et inaugureront la mise en réseau de nos différents microordinateurs.

Voyons maintenant de manière plus détaillée les différentes fonctions que nous avons pu assurer sur nos microordinateurs. Quelques-unes de ces applications n'ont rien d'exceptionnel, d'autres par contre sont plus originales. Mais le simple fait d'en faire un tour d'horizon démontrera que les microordinateurs offrent un éventail de possibilités très large.

## 1. L'acquisitions des périodiques

L'acquisition des périodiques constitue une fonction tout à fait courante des bibliothèques, mais la complexité de leur gestion en complique l'informatisation. C'est pour cette raison que nous n'en n'envisagions l'automatisation qu'avec un logiciel prêt à l'emploi.

Le progiciel MICROLINX, produit par la société FAXON, fut présenté en 1986 à la première Conférence Européenne des Bibliothèques Médicales à Bruxelles. Ce produit neuf répondait parfaitement à nos besoins et il nous fut accordé par FAXON qui nous choisit comme site pilote européen.

MICROLINX propose l'automatisation de toutes les fonctions courantes de la gestion des périodiques, à commencer par le bulletinage qui assure l'enregistrement des fascicules réceptionnés tout en prévoyant la date d'arrivée du prochain numéro. D'où la facilité de production automatisée des rappels de tous les fascicules dont le retard dépasse le délai d'attente fixé. Ces rappels sont par la suite affichés, listés, imprimés ou envoyés en ligne chez FAXON. Outre ces deux fonctions essentielles, MICROLINX prévoit des modules de circulation, de reliure, de statistiques et de gestion financière des abonnements. Il permet en outre l'édition de différentes listes d'acquisition et fournit tous les renseignements bibliographiques et comptables souhaités. Toutes ces fonctions sont donc assurées par le logiciel avec une rigueur et une rapidité sans aucune commune mesure par rapport aux procédures traditionnelles du Kardex.

Enfin, la connexion en ligne (LINX) dont il a précédemment été question, permet non seulement l'expédition des rappels chez FAXON, mais aussi l'envoi des commandes, de messages divers ainsi que la consultation d'une base de données concernant près de 200.000 périodiques.

## 2. Les télécommandes de documents

Les demandes de reproduction d'articles à l'extérieur constituent une des fonctions importantes de toute bibliothèque médicale, et il convient d'assurer rapidement et efficacement leur localisation, leur commande, leur réception, etc. A cet effet, nous avons voulu exploiter les avantages de la microinformatique couplée à la télématique et avons conçu un logiciel de télécommandes de documents automatisées. Ce logiciel, baptisé TELEDOC, propose l'automatisation de

quasi toutes les étapes du prêt entre bibliothèques : encodage, localisation, envoi, facturation, statistiques, etc.

La première étape consiste en l'encodage des références du document souhaité; ceci est encore actuellement réalisé par le bibliothécaire sur son propre PC. Les différentes localisations des documents recherchés sont ensuite relevées automatiquement dans le catalogue collectif des périodiques biomédicaux en cours en Belgique "BIOMED" stocké sur le disque dur du PC. Parmi la trentaine de bibliothèques participantes, TELEDOC sélectionne celle qui correspond aux priorités établies préalablement par le bibliothécaire (rapidité et coût). S'il s'avère que le document n'est pas disponible en Belgique, le logiciel offre la possibilité de sélectionner des bibliothèques ne figurant pas au BIOMED, telles que la BLDSC ou le CNRS.

TELEDOC expédie ensuite les demandes par courrier électronique aux bibliothèques sélectionnées, et c'est donc à ce niveau que le logiciel met la télématique au profit du prêt entre bibliothèques. Dans le cas des bibliothèques ne disposant pas de boîtes aux lettres électroniques, le courrier électronique est en mesure d'orienter automatiquement les commandes vers leur télex. Enfin, dans le cas des bibliothèques sans télex ni courrier électronique, les demandes sont imprimées localement et envoyées par courrier ordinaire. TELEDOC s'adapte donc à différents modes de communication, mais c'est au courrier électronique que va naturellement notre préférence puisque celui-ci permet d'atteindre très rapidement tant des bibliothèques belges qu'étrangères, dont entre autres la BLDSC.

Outre la localisation et les télécommandes automatisées, TELEDOC assure plusieurs fonctions complémentaires telles que les rappels et renouvellements des commandes en souffrance, la facturation des documents fournis ou encore des statistiques par bibliothèque, par périodique, par usager, etc.

Ce logiciel de télécommandes de documents a été réalisé en un an à mi-temps par un jeune bibliothécaire-informaticien. Grâce à son option pour l'autonomie et la souplesse de la microinformatique d'une part, et pour la télématique d'autre part, TELEDOC est remarquablement efficace et plein d'avenir :

- il permettra non seulement dans un avenir très proche de recevoir automatiquement des commandes de documents formulées par les usagers eux-mêmes sur les PC en salle de lecture, mais également, dans un avenir un peu plus lointain, toutes celles qui seront formulées sur les PC de la Faculté lors de leur mise en réseau;
- il transmet ses télécommandes à un nombre sans cesse croissant de bibliothèques recourant au courrier électronique;
- enfin, il est appelé à consulter prochainement les catalogues collectifs sur CD-ROM.

Ce système de télécommandes automatisées n'a, à notre connaissance, aucun équivalent sur le marché de la microinformatique et a de ce fait séduit plusieurs collègues qui l'ont adopté dans leur bibliothèque à Bruxelles. Enfin, il est clair que le recours à un outil commun améliorera la

fourniture des documents entre nos différentes bibliothèques et la coopération entre nos différentes institutions.

### 3. Les catalogues collectifs

Le catalogue collectif des périodiques biomédicaux auquel une trentaine de bibliothèques participent depuis maintenant 4 ans, est donc stocké sur disque dur pour y être consulté par TELEDONC. Mais puisque tout catalogue collectif est appelé à être remanié régulièrement, nous avons également développé un logiciel de mise à jour et de réédition du BIOMED toujours sur PC. Il va de soi que tous les catalogues collectifs nationaux ne peuvent pas être stockés sur PC, mais on aurait tort d'en sous-estimer les capacités puisqu'avec 4.285 titres, le BIOMED se limite à 1 MB et peut même être distribué sur disque souple.

Enfin, le principe d'édition et de mise à jour du BIOMED est également assuré pour l'inventaire des périodiques en cours dans les 80 unités de notre Faculté et de notre Clinique Universitaire.

### 4. La consultation en ligne des bases de données bibliographiques

Est-il encore nécessaire de signaler l'importance de la consultation en ligne de bases de données bibliographiques et les avantages du microordinateur comparé au simple terminal ? Un simple PC couplé à un modem, à une carte et un logiciel de communication permet de préparer les questions avant la connexion, de télécharger des références et de stocker celles-ci sur disque. Ceci nous évite de prolonger le temps de connexion en ligne en imprimant d'encombrantes listes de références non-lisibles en machine. Les résultats de la recherche sont ensuite exploités par un traitement de textes ou un logiciel de gestion de fichiers.

### 5. La consultation de bases de données bibliographiques sur disques compacts (CD-ROM)

Les disques compacts constituent un nouveau support de l'information accessible par microordinateur. Leurs capacités sont gigantesques puisqu'un CD-ROM de 12 cm contient 200.000 pages de texte ou un demi milliard de caractères.

Le CD-ROM est devenu très rapidement un support privilégié de l'information bibliographique : plusieurs bibliographies nationales seront bientôt publiées sur disques compacts. Les books-in-print américain, britannique et allemand sont déjà disponibles de même que plusieurs grandes bases de données bibliographiques comme MEDLINE avec ses 6 éditions concurrentes.

Les possibilités offertes aux bibliothèques médicales sont séduisantes puisque les CD-ROM de MEDLINE peuvent être

consultés sans autres frais que la souscription annuelle; ceci permet aux usagers, initiés ou non, d'utiliser MEDLINE en libre service. La popularité de cette formule est telle qu'elle donne un surcroît d'activités aux bibliothèques qui l'adoptent, à tel point que les consultations en ligne - qui devraient pâtir de cette concurrence - augmentent elles aussi pour compléter les résultats trouvés sur CD-ROM.

En ce qui nous concerne, nous avons bien évidemment acquis une des versions du CD-ROM de MEDLINE que nous envisageons de mettre en libre service d'ici le début de l'année prochaine. Nous ne doutons pas que nous avons enfin trouvé un support qui augmentera le nombre de recherches bibliographiques à la Bibliothèque.

## 6. Le catalogue des livres

Le catalogue des livres de notre Bibliothèque fonctionne encore toujours sur notre miniordinateur; nous ne pouvons donc guère faire état de notre expérience de la microinformatique en la matière. Disons seulement que les disques durs des PC actuels permettent largement de stocker notre catalogue de livres et que nous prévoyons de le faire en 1989 avec l'un des logiciels disponibles sur le marché.

## 7. La gestion du prêt

De même que pour le catalogue des livres, la gestion du prêt - encore actuellement assurée par notre miniordinateur - le sera bientôt par un PS qui servira de serveur sur le réseau que nous prévoyons d'installer au sein de la bibliothèque.

## 8. Les applications non bibliothéconomiques

Les bibliothécaires auraient tort de négliger le parti à tirer des microordinateurs pour les applications non strictement bibliothéconomiques. En effet, les tâches administratives classiques ne sont pas à négliger et, en exemple, citons-en quelques-unes où la microinformatique se révèle d'une aide précieuse.

- Le traitement de textes fait bénéficier le secrétariat de plusieurs avantages : rédaction accélérée, édition améliorée, recherche et archivage automatisés de la correspondance. Outre le gain de temps appréciable que le traitement de textes a procuré à la Bibliothèque, il a donné aux membres du personnel une plus grande autonomie dans leur activité propre.
- La comptabilité n'est pas souvent le point fort des bibliothécaires, mais elle est essentielle pour assurer un gestion rigoureuse des bibliothèques. De nombreux logiciels de comptabilité pour microordinateurs existent sur le marché, mais ils sont généralement prévus pour le secteur privé et sont de ce fait beaucoup plus sophistiqués qu'il ne le faut

dans le cas d'une bibliothèque.

Le bibliothécaire hésite donc non pas tellement devant le prix d'achat souvent modéré, mais devant la sophistication excessive de ce type de logiciel. Dans le cas de notre Bibliothèque, nous développons un logiciel élémentaire mais suffisant pour les besoins de notre comptabilité.

- Le courrier électronique, tant au sein de l'institution qu'entre bibliothèques d'institutions différentes, permet de remplacer très avantageusement le courrier ordinaire. Dans le cas du Bureau Exécutif de notre Association Européenne et des Comités d'Organisation de cette Conférence, il permet de recueillir en quelques jours ou en quelques heures les avis écrits de collègues concernant une décision collective à prendre.

Voilà donc résumées les fonctions assurées par nos différents microordinateurs et celles que nous prévoyons d'y installer d'ici quelque temps. Après deux années exactement, nous disposons de trois PC et venons d'acquérir deux PS qui devraient permettre aux applications précitées de fonctionner en réseau et aux usagers de la Bibliothèque d'interroger notre CD-ROM MEDLINE. Enfin, la mise en service du réseau de PC de notre Faculté devrait permettre aux étudiants et au personnel d'accéder à nos services à partir des locaux académiques, des laboratoires et de la clinique universitaire.

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## CONCLUSIONS

L'informatisation, sans être une solution à tous les problèmes est une nécessité à terme, tant au niveau de la gestion locale qu'au niveau des échanges avec d'autres bibliothèques.

L'objectif de cette communication était bien sûr de démontrer les nombreux avantages de la microinformatique, mais surtout de montrer d'une part, l'éventail très large des fonctions que des bibliothèques petites ou moyennes telles que la nôtre peuvent assurer sur microordinateur, et d'autre part la possibilité de s'informatiser de façon autonome à peu de frais.

Comme l'indiquent la multiplication et la baisse des prix des PC et de leurs logiciels, la microinformatique progresse à grands pas, parfois même au détriment de plus gros ordinateurs ou d'imposants systèmes intégrés.

Les bibliothèques, petites ou moyennes, ont toutes les raisons de saisir cette chance au plus tôt, car l'informatique n'est plus aujourd'hui l'apanage des grandes bibliothèques.

Le microordinateur à usages multiples est donc plus que jamais d'actualité pour la plupart de nos collègues des bibliothèques et centres de documentation du secteur de la santé.

Microcomputer applications in the Oxford Region Library and Information Service (ORLIS), a network of 33 small libraries

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### INTRODUCTION

#### **The Oxford Region of the National Health Service (N.H.S.)**

The administrative divisions of the National Health Service are the 14 English Regions plus Wales, Scotland and Northern Ireland. The Oxford Region (population: 2.4 million) corresponds to the four counties of Berkshire, Buckinghamshire, Northamptonshire and Oxfordshire and is divided into 8 District Health Authorities. One District, Oxfordshire, is designated as a teaching District and contains the University of Oxford medical school. A teaching District is not, however, typical of the N.H.S. This paper is mainly concerned with the 7 non-teaching Districts. Hospital care in each of the 7 is centred on a District hospital providing most of the major medical specialisms. All but one District have additional hospital units which may include a second smaller District hospital or a psychiatric hospital. Primary care is provided by family practices with from 1 to 6 doctors together with nursing and other support staff.

#### **Library provision**

There are 33 libraries in the Region, the majority based in hospitals, of which by far the largest is the Cairns in the John Radcliffe teaching hospital with a staff of 13 and an annual non-staff budget of £90,000. The seven non-teaching Districts are served by one or more smaller library units with from 0.5 to 3 staff and annual budgets of from £2000 to £20,000. The largest library in a District is usually located in a postgraduate medical education centre in the District hospital and is open to all professional groups. Other libraries may be based in a school of nursing or midwifery, at the District



headquarters or on other hospital sites. The pattern of provision varies with the size and geography of the District. For example, Milton Keynes, the smallest District in both area and population (120,000), is served by one hospital and one library. In contrast West Berkshire, with more than three times the population (420,000) and four times the area, has seven libraries on five sites.

Most libraries are organised on a District basis under the management of a District librarian. The seven District library services, together with the larger libraries in Oxford, are linked in a regional network sharing resources and expertise. In-service training is organised regionally with a current emphasis on management skills and information technology. Regionally co-ordinated services include online searching and interlibrary loans. A Union List of periodicals containing 6000 location entries for 1400 titles is maintained on a computer in the Cairns and published yearly as a 150 page listing. Of 25,000 photocopy requests in 1987, 49% were satisfied within the Region and 26% by the British Library Document Supply Centre. The number of book loan requests is lower (4700), there is no union list of books and the proportion satisfied within the Region is also lower at 29%.

A paper at the First European Conference of Medical Libraries<sup>1</sup> described computer applications in the Cairns. The present paper describes developments in online searching, cataloguing, electronic mail, word processing and computer literacy in the other smaller library units in the Region.

#### COMPUTER APPLICATIONS IN THE OXFORD REGION

##### Online searching

Ten years ago, before the microcomputer revolution, only the Cairns offered online searching. The first stage in spreading online around the Region was the purchase of a portable 'dumb' terminal with built-in modem which was used for for demonstrations in the District libraries. As a result either terminals or microcomputers were purchased in each District.

Selection of equipment started after MSDOS had been accepted as the standard operating system for micros but before IBM compatibility had also become a standard requirement.

Purchases were made over the period of four years (1984-7) during which the technology changed rapidly. There was no compulsion to purchase the same machines, but all Districts chose Apricots. Early machines were IBM XT equivalents, with 10Mb discs; later purchases were of AT equivalents using the 80826 chip and with 20Mb hard discs. Most machines use COMMUNIQUE, an internal modem and software communications package, supplied by Apricot at a cost of £350. This allows for automatic dialling and password input and for downloading of search outputs onto disc. The seven non-teaching Districts recorded 2100 online searches in 1987; the majority were MEDLINE searches on DATASTAR. The number of searches varied from 613 in the most active District to 119 in the least.

### Cataloguing

In all Districts, the major library is using a microcomputer for cataloguing and in four Districts the full catalogue of between 2000 and 4000 items is stored on disc. So far the catalogues are those of the main library but some Districts are now moving toward union lists for all libraries in the District. When automation was being introduced, there were several single-user cataloguing packages in the market, but no clear evidence as to which package was best suited to small libraries at prices they could afford. Once again there was no compulsion to purchase the same product for all libraries. The commercial packages chosen were CORMORANT (1 library), CARDBOX+(1), and INMAGIC(4). One library used a package developed by a local computer supplier. CORMORANT comes with its own ready-made thesaurus in the health management subject area and the suppliers also offer a database of Department of Health circulars. INMAGIC, the most popular choice, costs £1200 for the first and £600 for subsequent copies in the Region. It is being used in other Regions and is probably the most widely-used cataloguing software

in NHS libraries. It allows the users to define fields, search any field for a word or word-stem, use Boolean operators and define which fields are to be displayed on screen or printer. It is integrated with other products, HEADLINE and HEADFORM, designed for online searching and the downloading and reformatting of records for entry into the catalogue.

Creation of a regional union catalogue of books has not so far been a priority but an experiment is now being conducted at the Regional Computer Unit on merging samples of 100 catalogue records from each of 5 Districts, supplied on floppy discs.

### Electronic Mail

The COMMUNIQUE software provides access to public electronic mail services which have been used to a limited extent for editing reports authored by more than one librarian and in a pilot experiment for requesting interlibrary loans. This was suspended after a 3 month trial period because the telephone and mail box costs were too high for the procedure to be cost-effective. This illustrates the need of small library co-operatives for an infrastructure of low-cost electronic networks.

### Computer literacy

Perhaps the biggest gain over the past five years is computer literate District librarians. They are not necessarily computer enthusiasts but are confident in using computers and familiar with online, cataloguing, electronic mail and other applications. These were people selected for library not computer expertise and deserve much credit for acquiring these new skills.

### Other applications

Other applications include word processing and, most recently, CD-ROM versions of MEDLINE and Psychinfo. However, the things that were not done with a microcomputer reflect the character of these NHS libraries as much as those that were done. For example, spreadsheets have found little application outside the Cairns. Only one District has circulation control and none are using the computer for serials or ordering. There are no Online

Public Access Catalogues (OPACS) largely because it is not feasible to allow reader access to a single machine already being heavily used for cataloguing, online searching and word-processing.

#### ACTIVITY IN OTHER REGIONS

The level of Regional and District co-ordination varies widely among Regions, but the pattern of computer applications described above is to be found in some Districts in most Regions. Wessex South West Thames and South East Thames have union book catalogues. The most advanced is in South East Thames which uses LIBRARIAN software running under CP/M on a COMART 80836 multi-user micro. There is no downloading from outside sources; all catalogue records are prepared in-house. Contributing libraries can search the union catalogue from remote terminals or download their own subset of the catalogue or be supplied with catalogue cards.

#### A SECOND GENERATION OF COMPUTER APPLICATIONS

We are coming to the end of the first generation of computer applications in NHS libraries and starting to plan a strategy for a second. As a foundation for that planning we have a computer-literate workforce and the availability of sufficiently powerful hardware and software at affordable costs. The hardware certainly, and the software increasingly, are available to meet our more ambitious requirements. The computing power for a main District library, with links to other libraries in the District, can be provided by micros based on the 80836 chip with a multi-user operating system supporting up to 16 ports. The starting price for this configuration is £6,000 - £7,000. MSDOS networks offer another approach to a multi-user configuration.

A key decision must be made in relation to union catalogues. The printed periodical catalogue has proved an enormous success. We must ask if there are advantages in online access to this catalogue and if a union catalogue of books is also needed, noting that the level of book lending is only one-fifth that of photocopies of periodical articles. Would a union catalogue

increase lending? If we have one, should input be centralised or distributed and how should access be offered?

### Design principles

Given that decisions have been made on the above issues, there are three major design principles for our strategy:

1. The present organisational network must be matched by an electronic one for sending messages and, using facsimile transmission, documents between libraries. Low cost data networks cannot be created by libraries alone. We are dependent on the NHS, or on national or European Community initiatives
2. Links must be established with the other information activities in health care, and with management information in particular. One model is the Integrated Academic Information Management System (IAIMS) development in the United States<sup>2</sup>.
3. End-users must have more direct access to information. They must be able to do their own searches of the library's OPAC and of MEDLINE and other external data bases, possibly using CD-ROM, and order their own interlibrary loans. Librarians will build and maintain the system, the user will use it.

### REFERENCES

1. Leggate, P. A multi-user microcomputer system for small libraries In: Deschamps, C and Walckiers, M (ed). **Medical Libraries: co-operation and new technologies. Proceedings of the first European conference of medical libraries Brussels, Belgium. 22-25 October 1986.** North Holland Amsterdam. 1987. ISBN:0-444-70237-7. pp.339-346.
2. Matheson, N W (Ed). **Symposium: Integrated Academic Information Management Systems (IAIMS) model development. Bulletin of the Medical Library Association 76(3): 221-267 (July 1988).**

Concurrent session 6C

Technological advances - impact on libraries

Chair

M. Benda

## **Advances in Library Technology: The View From North America**

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This paper is a continuation of my presentation at the first annual conference. In 1986 I talked about developing integrated, automated library systems in America - how we computerized the basic functions of the library - acquisitions, cataloging, circulation and serials control - and how we created machine-readable records that could be accessed from terminals inside and outside the library. From this emerged the online catalog. Two years ago this was the great breakthrough. I would now like to talk about what has happened since. My presentation could be titled "Beyond the Online Catalog.

Today the major technological and socioeconomic challenges of health sciences libraries in the United States may be summarized as follows:

- The emergence of a range of new technologies
- Organizational changes within the library as we move to computer-based systems
- Changes in the health care system and the environment of libraries
- Overwhelming financial problems

My presentation focuses on important new technology, in particular, the first two in the following list:

- Computer workstations
- Local area telecommunications networks
- Dense data storage devices such as disks
- New products such as hypertext, computer-assisted instruction, computer graphics, video technology, expert systems, and artificial intelligence

### **Computer Workstations**

A development of great importance is the evolution of the online public catalog, which is now accessed through a network of computer workstations. There are now engineers' workstations that provide sophisticated graphing and mathematical analysis, and radiologists' workstations that display high-resolution images from digitized data. In libraries, we have computer workstations that are linked to telecommunications networks. Figure 1 shows the basic elements of a library workstation. Essentially, it is composed of a microcomputer to which peripheral equipment may be added and on which software may be used to perform a variety of functions. A basic system includes:

- The microcomputer, which is the heart of the workstation
- Connection via the telecommunications network to outside databases and computers
- A high-resolution monitor for imaging - both for static pictures and for moving video images
- A printer with text and graphics capabilities
- A disk player for optical storage disks, such as CD ROM

## The Library Computer Workstation - Linked to a Telecommunications Network

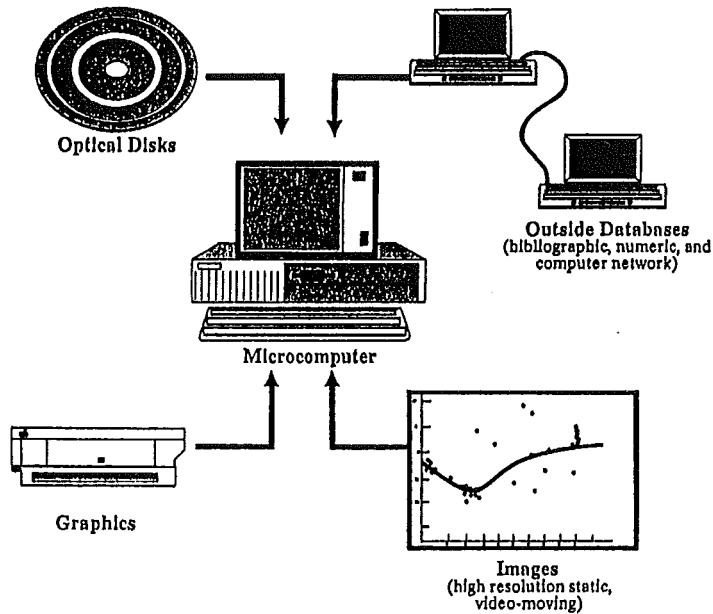


Figure 1

The objective is to provide information that is needed for research, teaching and clinical decision-making; to process that information; and to communicate with colleagues. Washington University's library workstation illustrates how these functions can be performed:

- Beginning with the library's holdings - the online catalog - the holdings of 34 libraries in the St. Louis community have been added.
- Health-related databases such as MEDLINE and Current Contents® are downloaded into a Washington University computer and can be used at low cost with small telecommunications charges.
- Special files such as directories, meeting schedules and medical center databanks have been added.
- A variety of software is available for statistical information processing, file management and record keeping.
- New learning media, e.g., computer-assisted learning programs and hypertext, are being tested and used by the medical center.
- Some 300 databases outside the library may be accessed.
- Local, national and international computer networks, e.g., BITNET, NSFNET, may be accessed, and messages or data may be transmitted.
- Online examinations are being evaluated for testing medical students.

Through the telecommunications network, faculty, students and practitioners can access any of these database subsets from the library, or from their homes, offices, hospitals or laboratories. The network has thus profoundly changed the nature and the capabilities of the library.



At Washington University we are completing a new \$16 million library that includes a laboratory of AV/computer workstations as well as individual workstations distributed throughout the library. There are some 50 workstations in the AV/computer laboratory for hands-on use by faculty, staff and students. We are teaching computer technology and database access, testing new AV/computer teaching tools such as hypertext and video computer-assisted instruction, and providing software for information management.

Public services workstations will serve as gateways to the many sources of information. These gateways will be seamless; in other words, they will lead users to the information needed - without their having to be aware of the number of sources that need to be searched or the different protocols that are needed to get through to them. Staff workstations will be used for library functions such as online searching, online cataloging, desktop publishing and managing library administrative data. A scenario might help to explain how the library workstations and the telecommunications networks are used:

Let's take a scientist who is beginning research on mapping neural networks. One of his first stops is the library. At a library computer workstation, he searches thousands of research papers to find relevant work published in his area. If he wants to contact some of the authors, he calls them through the information network and leaves a message on the electronic blackboard if necessary. He may request a publication through electronic mail; if it is not in the library, regional resources will be automatically searched until it is found. An interlibrary loan is electronically generated and the article is delivered by telefacsimile. When his data are collected, they are processed at one of the large main campus computers. He then uses software to generate graphs and other illustrations. For writing he uses word processing capabilities that edit the text. Just before publishing, he may send his manuscript to colleagues for comment through electronic mail. The laser printer produces a quality printout for submission to the journal of his choice.

All this may be done at the library computer workstations that are being devised for the new Washington University School of Medicine Library. The workstations are distributed among the eight levels of the library and linked with the university's electronic networks, which communicate with national and international information networks.

### Telecommunications Networks

Another very important development is telecommunications networks. These are powerful, high-speed networks that connect computers within an institution and to the outside world. Figure 2 shows a typical campuswide computer network. This one is at Washington University.

- Within the medical center, computers in the medical school, hospitals and research centers are linked by broad-band cable.
- Computers on the main campus, which is 2 1/2 miles away, are linked by microwave.
- Hospitals in the outside community are linked to the medical center computers by satellite.

On the medical school campus some 300 devices - from large mainframe computers to small personal computers - are linked to the network. This enables scientists to transfer large amounts of data to other computers for processing, to share resources between the two campuses, and to communicate ideas to each other.

Where does the library fit into all of this? The library is linked to the network through medical computing facilities as shown in Figure 2. This means that the library has access to all computers in the medical center, to the main campus computers by microwave, and to community computers by satellite. In turn, all these computers can access the library's databases.

### Telecommunications Network at the Medical Center

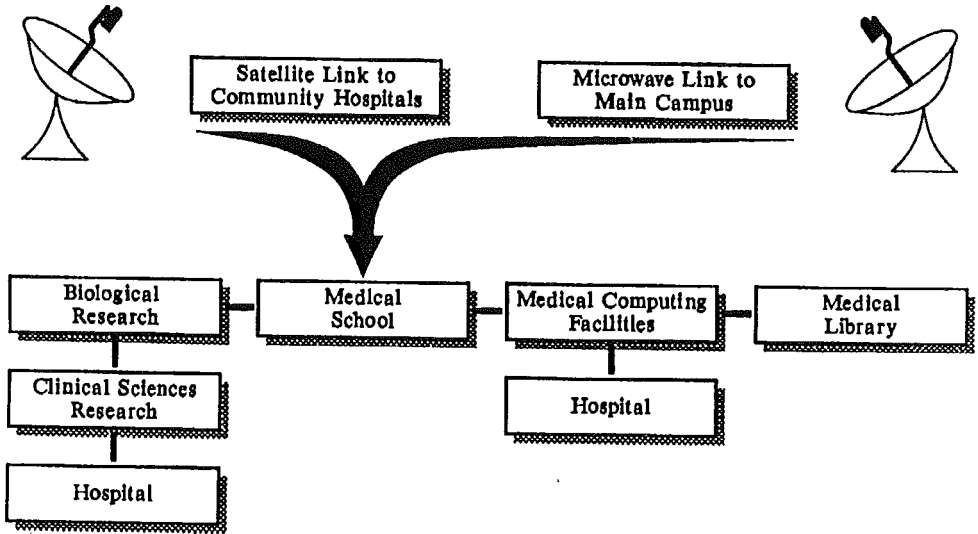


Figure 2

This is not in the distant future. At Washington University, the telecommunications network is in place. Prototype workstations are already operating. We plan to move into the new Library and Biomedical Communications Center with its AV/computer laboratory and network of workstations in the summer of 1989.

## DISCUSSION

In summary:

- We began by producing a machine-readable database that could be called up on the library online catalog through computer terminals. That was where we were two years ago.
- We added a telecommunications network that is connected to regional, national and international computers.
- From limited-purpose computer terminals we devised computer workstations consisting of a minicomputer and additional peripheral equipment.
- As a result, we have greatly - very greatly - changed our abilities to search, to retrieve, and to process information. And we can do it all at a single computer workstation. We have created the distributed library. These developments have much potential for changing the library itself, as well as the function of librarians.

A few new developments on the horizon that are still quite experimental should be mentioned. These are mainly devices that:

- Support decision-making
- Store and process rote data that once were memorized by students and practitioners
- Connect ideas and concepts that are embedded in text
- Provide high resolution images that are digitized and transferable over the network, c.g., X-ray images

We are talking about artificial intelligence, expert systems, hypertext and high-resolution imaging. All of these have much potential, but the products are not quite here yet. As we are just at the frontiers of these large new areas and to address them would require a day-long seminar, let us leave with this note.

For the present, the new developments I have discussed will not change the things we have always done: acquire new books and journals, process and circulate them, and give help to users. What will happen is that a range of new resources and services will grow up parallel to them. We will have to determine the new relationships and priorities. For example, the new systems will tell us where the resources are, but they will not - at least not in the near future - bring those resources to the user. For that, books and journals would have to be in machine-readable form. Then libraries might be able to plan in terms of access rather than ownership.

If people can do their own searches, order materials through an electronic network, use software to create new publications and make these accessible to colleagues elsewhere, just where does the library fit in? What is the role of the information intermediary? What kind of space is needed? Although the largest part of the library has been devoted to the storage of materials, this may no longer be so in the future. We may need more space for workstations (both staff and public), classroom and learning space, and laboratories for accessing and processing a wide range of media and databases.

With the ability to send electronic messages and the rapidly improving capacity to transmit text, future users may not need to enter the library at all. What do these and other changes imply for the organization of the library? Although, this will not happen tomorrow, in planning our future it is necessary to think about the possible outcomes.

## BIOMEDICAL LIBRARIES AND FULL-TEXT DATABASES

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### ABSTRACT

*The paper examines the main features of full-text databases in general and the functions that biomedical databases may serve as an electronic medical library service providing journals books and other information sources for use by librarians and health care professionals. The following topics are treated: market offer in the biomedical field (databases, host computers, user-friendly services); some considerations on the role of the end user; need for an intermediary and the impact of full-text databases on library services.*

### Introduction

The expansion of knowledge in the biomedical field is accelerating and numerous changes have occurred over the past forty years. For example, new techniques have revolutionized medicine and surgery, and endocrinology, cardiology and neurology have undergone radical changes. It is now necessary to have rapid access to what is going on in the research laboratories and centres and in industry. The growth in the amount of information available, the increasing amount of information required, as well as the need for rapid access to it have, particularly in this sector, revealed the shortcomings and inadequacies of conventional methods of information retrieval.

For doctors, as for any other specialized category which makes use of specialist information, the capacity to acquire, evaluate, store and retrieve new knowledge is inevitably limited unless an appropriate use can be made of the available information transfer technologies, which have radically modified traditional systems and methods of producing, managing, distributing and searching for information.

The existence in a number of countries of specialized telecommunications networks with distance-independent user tariffs, together with the links between these networks and with the switched telephone network, now mean that today it is an easy matter to have on-line access to numerous computers located in Europe and other parts of the world. These computers provide access to databases containing a huge amount of information in various forms (bibliographic information and abstracts of scientific articles, proceedings, patents, etc)<sup>1</sup>.

### 1. Characteristics of full-text databases

In the world on-line information market there has been a constant increase in the offer of full-text type databases. Furthermore, the host computers, which are traditionally suppliers of bibliographic database, are showing a growing tendency to make the former type available.

Out of the 3331 databases listed in the Cuadra/Elsevier Directory of Online Databases (July 88 ed.), 1081 (32.4%) are principally, although not wholly, of the full-text database type. There is an increasing trend to produce 'mixed' databases containing information of various different kinds (e.g. bibliographic information together with complete texts, etc.). The number of full-text on-line databases available for biomedicine and closely related fields are 33 (9 biomedicine; 16 healthcare/biomedicine; 1 psychology; 7 pharmacology).

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<sup>1</sup> - In Italy the National Referral Centre (CRID) operates within the framework of the the Istituto di studi sulla ricerca e documentazione scientifica of the CNR (National Research Council) in order to promote the use of on-line databases. Existing and potential users can contact the centre and receive advice on choosing products and on on-line information services at the following address: CRID-ISDRS, Via Cesare de Lollis 12 - 00185 Rome, Tel. 06/4452351.

It must be stressed, however, that full-text databases represent a supplementary and complementary source of information which cannot, however, supplant bibliographic databases. While the latter continue to perform their function of providing users with a reliable and indispensable tool for obtaining prompt and exhaustive references to documents published in the sector of interest, the full-text databases allow the user direct access to the actual text of the document at the search and result-retrieving stages. Access to these databases thus affords the user, especially the end user, a number of fundamental benefits:

- the possibility to make a direct, rapid search for information and data in the full text of various kinds of primary documents, and consequently also possibility to check the significance and relevance of the information retrieved;
- the possibility of searching for information using the same natural language as the author of the text, without having to formalize the terms used in the search strategy;
- the possibility of immediately visualizing also data "external" to the text of a document but possessing its own information content, e.g. tables, bibliographies, footnotes, etc.;
- the possibility of identifying worthwhile and relevant information even when it is 'peripheral' to the main topic. During the accessing of bibliographic databases this type of information is often lost without the users realizing it since the semantic elements used to represent the document contents during the search and response stages consist 'merely' of a number of key words often assigned through a controlled vocabulary and an abstract which, designed to provide only relevant information, is extremely concise, consisting of no more than a hundred or so words;
- greater speed of accessing information in that the content of on-line full-text databases is available for on-line consultation and can also be retrieved directly as a printout. In the case of bibliographic databases, for reasons related to the preparatory work of collecting and indexing the material, updating is obviously much slower, often being performed weeks and even months after the publishing of the information in paperform.

The possibility of making an accurate and immediate assessment of the relevance of the information found, which is the advantage to which all the others are directly or indirectly related, makes full-text databases a market product aimed preferentially at end users (and is moreover one which is much appreciated by them), rather than at intermediaries. The main reasons for this are as follows:

- whereas the intermediate user, not being directly interested, cannot judge whether a search is to be considered exhaustive and therefore tends towards completeness, the end user is mainly interested in the specificity of the information retrieved; he is not necessarily interested in completeness. The end user wants straight answers to his questions rather than, as the intermediary does, be given everything available on a given topic;
- the end user wants immediate, updated answers and is anxious to avoid the delays associated with conventional types of bibliographic searches and with obtaining the desired results;
- full-text databases provide the end user with a tool with which to locate what he is looking for and check that it exists;
- only the end user, who knows all about the problem to solve, can decide exactly how relevant the documentation accessed is for the purpose of finding an answer to his query.

## **2. The market for full-text databases: online services and products**

### **2.1. Sectors covered and nature of available information**

Full-text databases cover a wide range of disciplines. Furthermore, there are numerous printed publications whose full text is today available for on-line accessing: laws and regulations, monographs, articles published in periodicals, newsletters, encyclopaedias, repertories, daily newspapers, etc. Any analysis of the information available in full-text databases based on the topic treated must however take into consideration also the type of publication from which it is taken in order to provide a clearer idea of the information treated and its potential utility.

## 2.2. User-friendly services in the biomedical sector

There are a number of services, many of which with full-text databases, which are very useful for the professional updating of physicians. In the early 80's, with the rapid spread of microcomputers, on-line services began to develop simplified or 'user-friendly' query systems in which the end user was encouraged to make his own searches without necessarily involving an intermediary. These systems make searching very easy and do away with the need to learn a complex set of commands related to the procedure for querying a particular database. A number of services of this type are available in the biomedical sector and it is certainly to be recommended that they should be made available also to end users in libraries and documentation services.

### 2.2.1. Dialog Medical Connection (DMC)

Medical Connection is a Dialog service which can be accessed through a single contract also by subscribers to the traditional system and is specially designed to cater for physicians, biomedical researchers and health practitioners in general.

There are two methods of access to this service: menu-driven and command-driven. The first system, intended for inexperienced users, leads them step by step through the search; using the second or command-driven system, a number of commands which differ slightly from those used in normal Dialog searches, allow the entire query system to be exploited. At any stage the user can go from the menu to the command system and viceversa. On-line help is also available.

Through DMC the user can log into 4 information systems, which may be accessed singly or all together. These systems offer specialist information of various kinds and are divided into the following 4 sectors or 'libraries':

- Medical Reference Library, comprising different types of databases, e.g. *Embase*, *Medline*, *Psycinfo* *International Pharmaceutical Abstracts*, *Drug Information Fulltext*, *Clinical Abstracts*, *Health Planning & Administration*, *Cancerlit*;
- Bioscience Reference Library, referring to the biological science sector, which includes *Biosis Previews*, *Agricola*, *Cab Abstracts*, *Food Science & Technology Abstracts*, *Life Sciences Collection*;
- Sci/Tech Reference Library, referring to the mainly scientific and technological aspects of biomedicine, including *Scisearch*, *Casearch*, *Compendex*, *Inspec* and *Ntis*;
- General Reference Library, containing databases not specifically dealing with the biomedical sector, although related to it in some way, such as press records like *Magazine Index*, *Newssearch*, *National Newspaper Index*, those containing the text of several encyclopaedias, such as *Academic American Encyclopaedia*, or bibliographic information on published material such as *Books in print* or directories such as *Marquis' Who's Who in America*, etc.

### 2.2.2. Colleague Medical Search Service

Also this service provided by BRS consists of a user-friendly information retrieval system designed for health care professionals. It provides access to specialist databases at lower rates than those charged for standard BRS Search Services searches. The user is guided through the search process by a menu.

The service offers two systems, which also in this case are known as 'electronic medical libraries': *Bibliographic Indexes and Abstracts* and *Comprehensive Core Medical Library*. These two electronic libraries contain respectively bibliographic information and full-text databases.

### 2.2.3. The Gateways

Agreements between two or more distributors have led to the appearance on the market of several services providing direct access to available databases on a number of host computers: the gateway services.

There are several different kinds of gateway. Some are merely designed to afford users of a single host computer (without logging off, without prior agreements with all the hosts involved and with a single billing system) direct access to the databases of another host computer. One example of this is the gateway resulting from the agreement reached between ESA-IRS and PERGAMON-INFOLINE. In this type of gateway the only benefit to the end user is that he no longer has to follow the log-in procedures required to access databases belonging to several distributors.

Side by side with the above type, also expanded gateways have been developed which, among other things, allow the user to access databases available on different host computers by means of a unified and simplified query language. The latter type of gateway thus introduces several novel features into on-line searches. It is therefore interesting to examine the type of user for which this service is designed and to see whether, and to what extent, on-line searches through gateways may be of interest to a library or intermediary service, as well as the implications of using an expanded gateway for searches involving full-text databases.

EasyNet (a number of different versions of the service have been implemented in which some minor aspects have been adapted to suit the needs of users in different countries: the Italian version is known as MAGIC ON LINE) is the first expanded gateway to have been implemented, and is certainly the most complete. It provides access to more than 900 databases containing different kinds of information on practically all branches of knowledge and products, ranging from medicine and biology to the life sciences, from economics to finance and law. Its simplified menu-driven query language is highly user-oriented. This allows the end user without any experience in on-line information retrieval to perform searches from the terminal unaided, to the benefit of both himself and the librarian. The latter is thus less involved in the actual bibliographic search and has more time to deal with the more specific aspects of his profession, such as user needs analysis, studying the characteristics of the services, and will therefore be increasingly better placed to make recommendations and take action to cater for the user's information needs. Because of the user-friendliness of the interaction with EasyNet, the user of the library services will be able to carry out his own on-line searches with presumably satisfactory results since his lesser experience in the field of documentary searches will be compensated by his complete knowledge of the application sector and therefore by a clearer formulation of the information query.

The use of this type of gateway in libraries would bring further benefits with regard to the problems of cost management and the secrecy of passwords for access to the on-line information services. It is envisaged to provide access to EasyNet also without prior agreement with the distributor simply by indicating one's credit card number (American Express, VISA or MasterCard). The library user could then access the on-line retrieval system using the latter method. Despite what has been said above, the utilization of these services can run into considerable difficulties, partly because of the situation in some countries (like Italy) and partly owing to the limited search scope offered by these services with regard to full-text databases. From Italy, for instance, credit card access to a gateway is actually impossible despite the claims made by the service providers. In order to log into EasyNet and MAGIC ON LINE directly it is necessary to reach a prior agreement with the provider. This involves having to give one's password at each search session and the allocation of log-in charges to the centre holding the contract for access to the service. In addition to these problems, there are some doubts about the functionality of gateways in solving a number of problems, including the one we are interested in here, i.e. searching full-text databases.

### **3. Effects of full-text databases on libraries and documentation services**

A service providing access to on-line databases from inside the library structure considerably enhances the potential of the latter because it:

- extends access to wide range of different sources of information whenever needed;
- provides a powerful tool for retrieving interesting and relevant information also on sectors which are different and/or related to those for which the library is in any case 'obliged' to keep and manage documents;
- affords an opportunity for expanding, improving and supplementing the library services provided.

Nowadays not only are we witnessing a rapid growth in the amount of knowledge available and the sources of information relating to it, but also the fact that the same knowledge may be stored in different sources which may in turn be available on different supports involving different access procedures. 'Documents' therefore tend no longer to have a definite spatial location but to be available in multiple forms depending on the type of support on which they are stored and the procedures governing the way their contents can be transmitted and communicated.

Since the user no longer goes to the document, the document must come to the user and the latter may be willing to 'pay' only for the information actually used, thus possibly modifying the existing policy of subscriptions to periodicals or the purchase of primary documents such as monographs. However, it must be acknowledged that subscription to different periodicals or the purchase of monographic works and the use of the corresponding full-text databases must be considered as complementary and non-competing information retrieval tools. They represent sources of information that, although having the same origin, are designed to satisfy different types of information needs and are consequently used in different ways.

It must be stressed that the possibility of purchasing only the documents actually used can be provided both for a library or documentation service and for a single end user not only in the form of full-text database searches but also by searching bibliographic databases. This can be achieved by means of electronic publishing and in particular by supplementing the bibliographic database service with document delivery services. After completing an on-line search of a bibliographic database the possible next moves are as follows:

- direct on-line display of records forming the result of the search;
- request for an offline printout; this is less expensive than the previous method, but implies much longer delays in retrieving the search output;
- in some cases, request for search result output via E-mail.

This solution is intermediate between the preceding two with regard to both costs and delivery times. Generally speaking the results can be displayed in the user's mailbox the day after the order is despatched. All three proposed solutions nevertheless imply retrieval of the document not in its full text form but only that part which, using suitable indexing techniques, has been included in the bibliographic databases and which makes up the record. It will thus be possible to choose from among the several record formats of varying size and cost provided by the distribution services.

Whenever the need arises to retrieve one or more original documents resulting from a search carried out on bibliographic databases, an on-line request may be made for them to be forwarded by the document delivery service.

Of course, being an additional service, this implies increased costs. Furthermore, although the expanded gateway services ensure enhanced simplicity and uniformity, it is generally necessary to come to a prior agreement with the document suppliers before their services can be used. This may involve having to make numerous agreements depending on the databases accessed.

The user of a full-text database can consult the full text of the required documents on line. While eliminating the costs of document delivery this certainly increases those of telecommunications, log-in and access to the databases.

Of course, no a priori indications can be given as to which of the two methods (full-text or bibliographic database and document delivery) is the cheaper. The main criteria to be evaluated, taking into account the above-mentioned advantages associated with accessing full-text databases, are closely related to user type and the nature of his information queries, are as follows:

- whether the full text or only the more significant parts are required to satisfy the request for information (in the latter case full-text databases are more competitive also in economic terms);
- occasional need to retrieve the full text, also depending on the type and number of databases that have to be accessed;
- need for a real-time response;
- thorough knowledge of the topic and the search facilities offered by the full-text database; this not only leads to a more satisfactory search but also keeps down the log-in costs.

However, it should be stressed that full-text databases provide a satisfactory solution to the problem of document delivery only for the retrieval of comparatively recent information (also because of the objective impossibility of permanently storing huge quantities of data) and are not



suitable for retrospective searches. In the case of query by the end user the simplified search systems described above are definitely of interest to biomedical libraries for several reasons:

- they provide the user with all the information, of different kinds and drawn from different types of document, available for a given sector;
- they personally involve the user in the actual search by means of user-friendly interfaces;
- they use simple billing methods which make it easier for libraries to implement a paid query service.

The efficacy of a gateway service such as EasyNet, in particular for full-text queries, will depend on the specific needs of the library concerned, as well as on the end user who will receive the information directly or indirectly. The EasyNet query language is a handicap in searches involving full-text databases, although it does allow access to a large number of databases (both bibliographic and full-text) which would not otherwise be available (due to problems arising out of the different query languages and the need for prior agreement with the host computers) and which may not even be known. For this reason a number of libraries and documentation centres have added access to this gateway to their existing links with individual host computers or the local use of databases on CD-ROM. At least in Italy, objective obstacles stand in the way of setting up end-user-oriented query services centered around the libraries. Examples of these are the incomplete awareness of the potential offered by these technologies, technical problems related to unfamiliarity with telecommunications networks and related terminal equipment, lack of operator training, bureaucratic and administrative difficulties (contracts, billing, etc.).

One way of solving these problems could be to encourage on-the-job training of librarians which, as well as enabling them to overcome the technical difficulties involved, would allow them to perform the role not only of intermediaries but also of educators of the end user. They would thus be contributing to spreading that awareness of the potential of information science which is so necessary in an important sector like biomedicine. Another way would be to set up pilot structures in leader organizations in order to test these services and to serve as a reliable model for future initiatives. A first approach to experimentation could be to use the full-text databases on CD-ROM within biomedical libraries; in our opinion, the CD-ROM will give, in the next future, a great impetus to health sciences professionals to gain direct access to full-text databases.

#### REFERENCES

- Abbott J.P., Smith C.R., "Full-text and bibliographic ACS databases: rivals or companions", *Proceedings of the Sixth National Online Meeting*, New York, 1985.
- Clancy S., "BRS/ Saunders Colleague: An Information Service for Medical Professionals", *Database* 8, No. 2, June 1985.
- Cuadra/Elsevier, "Directory of online databases", July 1988.
- Florio J.P., "Colleague: An evolving Medical Information Network", *International Journal of Micrographics & Video Technology* 4, No. 1, 1985.
- Franklin J., Westwater J., "Biomedical Journals in an online full text database: A review of reaction to ESPL" In: *Proceedings of the Seventh International Online Meeting*, London, 1983.
- Gordon D., "Acquiring full-text documents: the information specialist's ongoing problem", 1984, *Proceedings of the Fifth National Online Meeting*, New York, 1984.
- Homan J.M., "End-User Information Utilities in Health Sciences", *Bull. Med. Libr. Assoc.* 74 (1) January 1986.
- Ifshin S. L., "BRS/ Saunders Colleague: Reaching the critical mass after the explosion" *Information Services & Use* 5, No.2, 1985.
- Kirby M., Miller N., "Medline Searching on BRS Colleague: Search success of untrained end users in a medical School and Hospital" In: *Proceedings of the Sixth National Online Meeting*, New York, 1985. Medford, N.J., Learned Information, 1985.
- Kittle P.W., "Putting the medical library online: Electronic bulletin boards and beyond" *Online* 9, No.3, 1985.
- Kwan J., Deeney K., "Dialog Medical Connection - An evaluation" *Online* 11, No. 6, November 1987.
- Quigley E.J., "Medis: full-text medical information retrieval service" *Database* 9, No 3, June 1986.
- Tenopir C., "Full-text databases", *Annual Review of Information Science and Technology*, 1984, vol.19.

Concurrent session 6D  
Library management

Chair

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THE BASE "DUPLICATES" : AN ON-LINE COLLECTIVE INTERDISCIPLINARY  
AND INTERNATIONAL CATALOGUE OF DUPLICATES OF JOURNALS' ISSUES

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Origin

The problem of duplicates and lacks of journals exists for many years in libraries. It is well known that some of them have a very important number of duplicates when others have lacks in their collections. The situation is general in all the documentation's world, but however takes a particular form in the fields where journals are important for the information transfert, that is to say in biomedicine and sciences.

These duplicates may come from gifts or publishers' promotional sendings. As for the lacks, they may concern issues never arrived or disappeared afterwards and which can be bought again only at a high cost when they are not out-of-print. Till now and yet to-day, lists of duplicates and lacks flow from libraries to libraries, each one telling the others what it could offer or what it needs.

In the health section of the Lyons interuniversity library, we did the same for many years. But in 1985 and 1986 we wanted to know how were used the duplicates we sent. Because of important gifts received, our library had in fact, a huge quantity of duplicates, nearly 6 000 issues that it sended by these lists or by giving regularly some titles to other centres. Let us say, moreover, that for reasons of time and place, a rather important number of issues was neither

handled neither kept even if they could have been interesting for other libraries.

So that, the issues we sent were asked for these reasons in 1985 and 1986 (comparative study)

	1985	1986
filling-up lacks.....	93 %	95 %
taking the place of cancelled subscriptions..	60 %	55 %
beginning new subscriptions.....	33 %	15 %

the sum is higher than 100 % as everybody could give many answers.

Obviously, we were meeting a need : taking the place of cancelled subscriptions and chiefly filling-up lacks as other libraries were unable, very often for financial reasons, to buy missing issues and, so that, could offer only incomplete collections to their users. But let us say, frankly, that in the end of 1986 we were absolutely stunned by the welcome given to our lists of duplicates. As a matter of fact, only in our health section, we have sent, then, in a few weeks, more than 1 600 issues and we were obliged to reconsider the problem. It was urgent to find a solution, as satisfying as possible because the traditionnal methods were becoming archaic, obsolete and frustrating for everybody. The givers were congested without having enough time for only reading the lists of lacks sent by other libraries.

So, we decided to create an on-line base of duplicates with the help of the S.U.N.I.S.T. -Serveur Universitaire National pour l' Information Scientifique et Technique- national host for french university libraries. This base would be a collective catalogue of issues' duplicates. The health section participated financially to the software production as well as the S.U.N.I.S.T. which has set its heart on that.

We wanted to build specific procedures very easy so that no special formation would be needed for searching. A constant

cooperation allowed the elaboration of some major principles and first the notion of volume. One has to point out what issues are duplicates not only for a journal's title but more precisely for a volume of a specific year. One has also to mention in which quantity he has duplicates. We saw also notions of supplement and shelf-mark, if the duplicates are so classified.

But, in anyway, if the data acquisitions are basic, we had also to consider the possibilities of modifications. The library could have new duplicates because of more gifts. It could also have had for one title other issues than ones previously written. As for the decrease, it could be also automatic, in the case of the request of issues by libraries (and the software had to foresee a decrementation). But the decrease could be done willingly if the giver took an issue from its duplicates' collection for its own needs.

Of course, a searching software completes the whole, allowing to see if such and such issues of such and such titles are available. An electronic mail-box system integrated in the searching software sends the requests to the mail-box of the library which has proposed that issue. Let us say that this base of duplicates is one of the few systems having such an integrated mail-box system. An information forum, opened during january 1988, allows the members to exchange remarks. We thought that this forum would be used because of the geographic dispersal of users. Very obviously, we had to assign duties to the users themselves. They are obliged to sign an agreement for obtaining a password. They have also to obey the users' guide given to them. They are answerable of the inventory of their duplicates and they agree to send free of charge in a month what they are asked for.

### Problems

These specifications being prepared, we met some problems : first financial ones. I told it before, the health section of Lyons Interuniversity library contributed to the software elaboration

but it could not do more. The S.U.N.I.S.T. -which had also participated in a large part- kept on to pay nearly the half of the cost of one hour searching. In a matter of fact, it was not possible to ask the users to pay the real price at least during the first years.

This situation induced us to open this base to private documentation centres and subscription agencies. These two sorts of users will pay a higher price than the one allowed to public libraries, this price being however different for the documentation centres and for the subscription agencies. The difference between them and the public services will pay the software improvements. The documentation centres could propose their duplicates and look for the issues they would need. The subscription agencies could find there the out-of-print issues which are asked for them. It is well stipulated that they will buy them to the other members of the base and we think that it will have a double result : financing improvements and inciting libraries to put their duplicates in the base as they could sell them. We met also psychological problems for changing minds from traditionnal paper lists to an on-line collective catalogue.

### Results

Chronologically we have passed different steps : during the autumn of 87, the base was opened only for the french medical university libraries. The promotion done at this moment raised up requests from french university libraries of other branches and as from december 1987 the base was interdisciplinary and has also, as members, some non-university libraries. In may 1988, by a constant information and by word-of-mouth we had the pleasure to welcome foreign public services from Switzerland, Italy, Spain whereas relations were established with other non french-speaking countries. The number of issues proposed is always increasing : 55 000 in may, 70 000 in june, 90 000 in september 1988.

For this reason, we had, first, to modify completely the software for doing it faster and better. On an other hand, we changed the data base name which became the C.C.I.D. : Catalogue

*Collectif International et Interdisciplinaire de Doubles i.e. International and Interdisciplinary collective Catalogue of Duplicates. That does show its supranational implantation and its extension to all branches.*

*In conclusion, I would say that, as we think, we have answered an unformulated question. Already the possibility for services of different countries to exchange between themselves issues available here but asked for there is becoming a reality. Duplicates could be exchanged directly, for instance, from Italy to Netherlands or from Belgium to Switzerland, the France having as fundamental and specific to own the host. We are asking to ourselves if we would not open, also, the base to the libraries of under-developped countries which could find there the documentation they need but they cannot buy.*

*The unpretentious idea which germinated at the end of 1986 is being turning gradually onto an on-line european interdisciplinary catalogue of journals' duplicates -perhaps the first european catalogue !- opened in the future, why not, to extra-european countries. The purpose will remain always the same : allowing to the libraries and documentation centres to offer their users complete collections of journals, being so more and more useful.*

## ANALYSIS OF THE JOURNALS RECEIVED IN THE SCHOOL OF MEDICINE OF THE UNIVERSITY OF TORINO, ITALY : THE RELEVANCE OF OUR RESOURCES

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### Introduction

The Medical School of the University of Torino has improved the organization of its libraries (1) by creating a central library service called Biblioteca Centralizzata di Medicina e Chirurgia where reference services and online searches are available for academic and external users.

The "Biblioteca Centralizzata" project involves the centralization of most journal collections including centralized acquisition and catalogue services : this part of the project is still delayed by the need of new appropriately reorganized premises.

In the Summer 1987 the Biblioteca Centralizzata was requested by its director and the dean of the medical faculty to survey the journal subscriptions in all departments in order to identify double or useless subscriptions and to suggest a rational way to obtain a radical service improvement.

### Methods

The data collected from each department were controlled and added to the "List of Serials of the Medical School" (1984).

In the survey only the journals whose bill was paid with university or research funds were included. Personal subscriptions and free copies were not considered; moreover, the Medical School does not officially receive exchange journals.

Since no recent survey (2) of the usage of the biomedical journals received by this library was available, the new journal list was compared with the most used biomedical databases and reference materials. Therefore, the results are useful to evaluate the relevance of journal resources for online and manual searches.

In the first report a copy of the SCI journals divided by category and ranked by impact factor (3) was sent to each department. In the list the journals available in the libraries were marked in order to point out those highly ranked journals that were not available.

In the present paper we analyse and discuss these data.



## Results

We carried out a survey of 1,509 subscriptions. The current titles are 1,219, 160 of the latter represent double subscriptions; more than two copies of 57 titles were purchased.

The current titles (1,219) were compared with the "List of serials indexed for online users, 1987" (only the current titles were considered) (4), the "Publication List" of Current Contents/Life Sciences (5), the List of Source Publications of the Science Citation Index (6) and the most recent Brandon List (7). As shown in Fig. 1, only 19.4% of the "List of Serials..." is available, 30% of the CC/LS, 32% of the SCI, 77% of the Brandon List of which 31 titles were lacking and 6 of them were nursing journals.

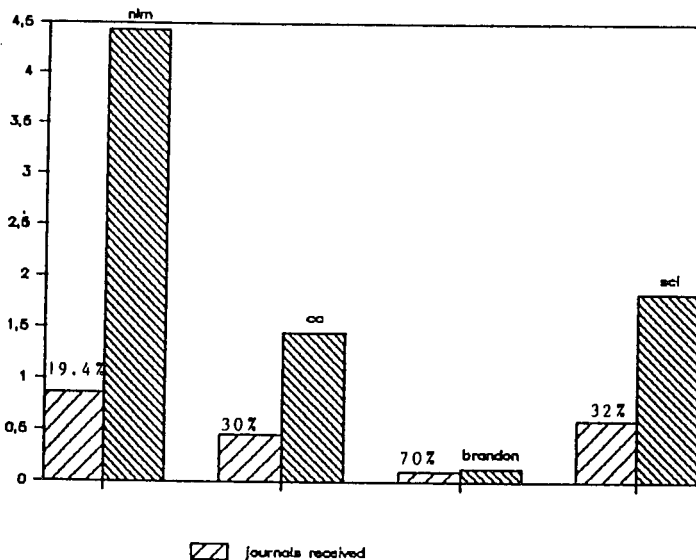
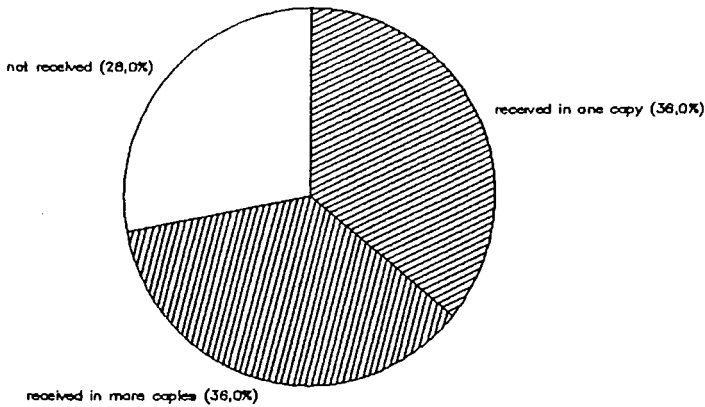


Fig.1 - Comparison of titles received with NLM List of Serials, Current Contents/Life Science Publication List, Brandon List and Science Citation Index List of Source Publications.

A very interesting result was obtained by comparing the list of journals (and the "double" and "more than two copies" lists) with the SCI/JCR journals ranked by impact factor. Fig. 2 shows that among the top listed 150 journals 28% are not currently received but 36% are subscribed in more than one copy.

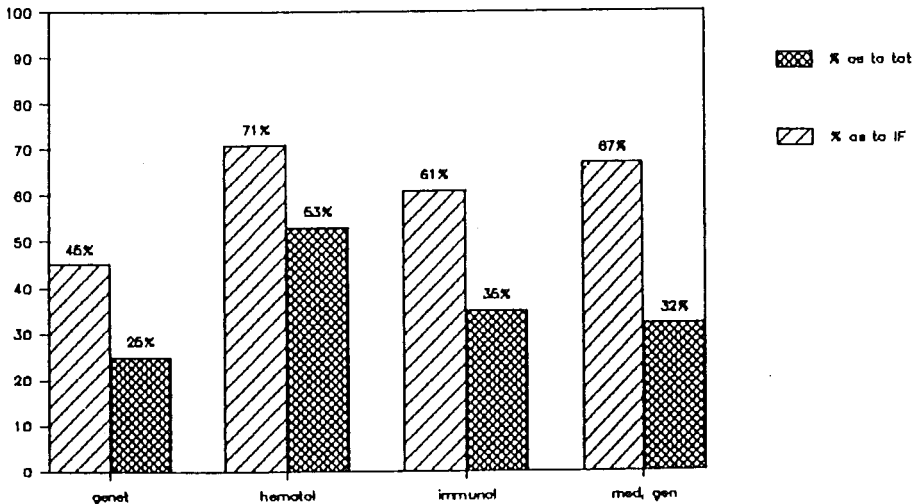


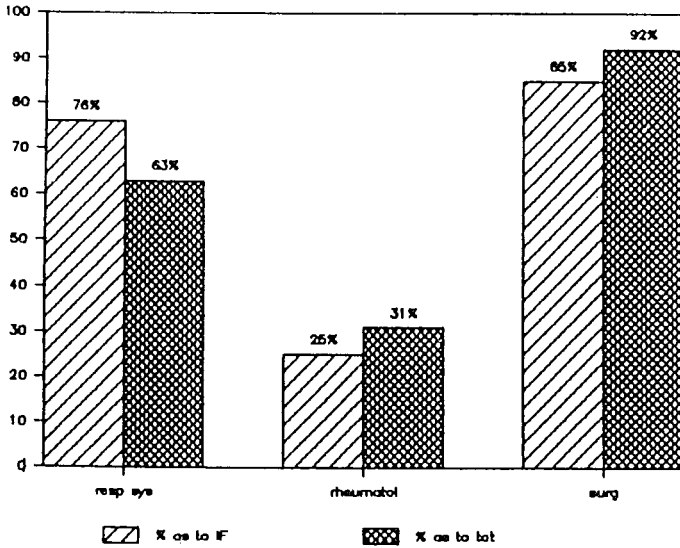
**Fig.2 - Percentage of titles received in one copy and multiple copy as compared with first SCI/JCR 150 biomedical journals ranked by impact factor\*. 42 out of 150 (28%) are not received.**

\*Impact factor: A measure of the frequency with which the 'average article' in a journal has been cited in a particular year. The JCR impact factor is basically a ratio between citations and citable items published. (from Garfield E, 1985:108)

The comparison with the "SCI/JCR journals compared by category ranked by impact factor" is shown in Fig. 3 and 4 and demonstrates that, even if just a percentage of the ranked journals are available within the listed total, the highly ranked journals are indeed received.

We found just one exception to this rule : all the titles of surgery were in fact received.





We also considered the titles received by Minerva Medica, the Molinette Hospital Library (now USL n.8). As shown in Fig.5, a percentage (12.5%) of the titles indexed by NLM is received by Minerva Medica and not by the Medical School Libraries. They are mainly journals published in Eastern countries, received as exchange subscriptions.

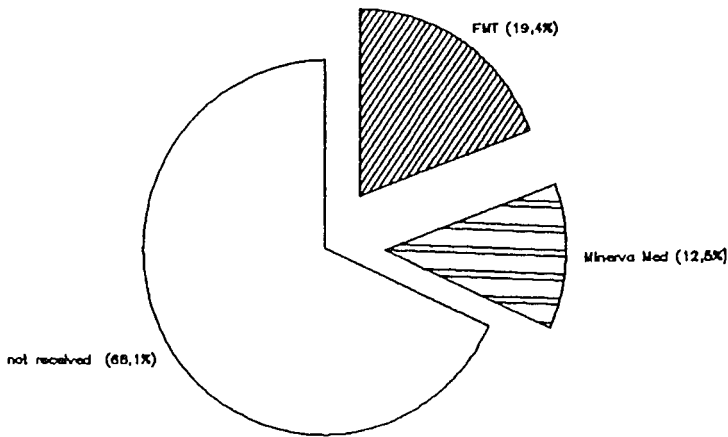


Fig.5 - Comparison of journals received at the Faculty of Medicine of Torino and Minerva Medica with NLM List of Serials. Values are given as percentages.

Then, we checked the actual availability of the journals among the 28 Dept. Libraries and the Biblioteca Centralizzata.

On the whole, opening times vary from 2 to 35 h. a week, with an average of 20 h. a week.

While most of the libraries provide photocopy service, only 5 of them guarantee interlibrary loans (most requests are met by the Biblioteca Centralizzata and the Neurological Dept. Library for a total amount of 450 journal articles a year).

### Discussion

The first interesting result of this survey is the very low percentage of the journals received within the "List of journals indexed..." of the National Library of Medicine : this justifies the low overall effectiveness of the online search service based on Medline. The users are satisfied with this service but they manage to find only a few articles in the library and are therefore forced to find the material in different libraries out of Piedmont. This indicates that there is a marked need to expand the list of purchased journals not only within the NLM but also in the SCI list.

Since the department libraries are still scattered in different buildings often quite far away, some fundamental general reference titles are purchased in multiple copies. Then, it is wiser to postpone decisions on deselection of the latter titles at least until library resources are actually centralized in one single premise. In fact, deselection decisions made by individual departments will lead to the loss of important and often expensive journals.

### Conclusions

This survey suggests to increase the number of titles purchased, though it confirms the relevance of the present journal list.

The low availability of subscribed journals - due to short opening times of Dept. Libraries - can be eased by the central library service.

The centralization project should involve more Dept. Libraries and set common purchasing policies with the Unita' Sanitaria Locale (Local Health Authority).

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## References

- (1) Comba V. Le biblioteche della Facolta' di Medicina di Torino: analisi, critica, progetto. In: Alberani V, Poppi G, eds. Convegno su biblioteche e centri di documentazione nella biomedicina: realta' e prospettive, 12-14 dicembre 1984 : atti. Roma: Istituto Superiore di Sanita', 1986:1201-1202.
- (2) Salimei M, Novari E. Procedure: acquisizione, circolazione e conservazione dei documenti. In: Carosella MP, Valenti M. Documentazione e biblioteconomia. Milano: Franco Angeli Editore, 1982:63-90.
- (3) Garfield E, ed. SCI Journal of Citation Reports: a bibliometric analysis of science journals in the ISI Data Base, vol.18. Philadelphia: Institute for Scientific Information, 1985.
- (4) National Library of Medicine. List of serials indexed for online users, 1986. Bethesda: National Library of Medicine, 1986.
- (5) Current Contents, Life Sciences. Publication List, January 1986. Philadelphia: Institute for Scientific Information, 1986.
- (6) SCI Science Citation Index 1986 Guide and Lists of Source Publications. Philadelphia: Institute for Scientific Information, 1986
- (7) Brandon AN, Hill OR. Selected list of books and journals for the small medical library. Bulletin of the Medical Library Association 1987;75:133-165.

INTERLIBRARY LOANS CONSIDERED BY A BIOMEDICAL LIBRARY. WHAT HAVE THE NEW  
NORDIC TOOLS OF LOCALIZATION MEANT TO THE WORK IN CONNECTION WITH THE  
INTERLIBRARY LOANS?

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The gist of librarianship is the art of retrieving relevant information and making this available to the library user. This is routine in every library all over the world. Several statistics from all kinds of libraries state that the interlibrary loans have increased violently in the last years - and are still increasing. The production of information is over-whelming which alone creates an increase in the interlibrary loans as no library can be entirely self-supporting. In spite of the fact that much information is contained only in data bases, printed documents are still an important element in the dissemination of knowledge.

It is, however, not only the dimension of the "explosion of knowledge" which is causing the increase in the interlibrary loans. Generally, people on all levels of education participate in some kind of continuing education. Today more people have better language qualifications than 25 years ago. These changes have resulted in a demand for information which no longer is limited by language barriers. Other causes for the increasing interlibrary loans might be found in the decreasing economic resources. For lack of money one buys, of course, only documents requested. The broad, all-round selection is a thing of the past, and the libraries are forced to borrow what was formerly bought. The cut-backs in the libraries also create another problem. Because of decreasing demand impressions get smaller and librarians often experience that a book they would have bought is sold out - and then the only possibility is to borrow the book from another library.

Our users - the physicians - and especially the young ones, are very "computerliterate". It is no longer possible to put a young physician off with the holdings of one library. They are aware of on-line searching and are not afraid of using the PC's themselves, in fact they are much more afraid of missing important published (or even unpublished) information. It is obvious that new technology influences the number of loan requests. Computerised searching is one aspect of new technology, tracing documents from internal or even from libraries abroad is something quite different. At present there is an increase in the introduction of automated catalogues.

We will shortly outline the most important Danish and Scandinavian possibilities. The largest and most important base for location in Denmark is the

ALBA/SAMKAT base. This is a union catalogue covering the accession of foreign literature in about 180 Danish research libraries. The base was established in 1979. Since 1984 it has also included foreign periodicals and it furthermore contains information about Danish national bibliography since 1976. The contents of the base is, however, non-homogeneous. The libraries were connected at different points, they reported with different intervals, and the reporting of the old acquisition leaves much to be desired. Through the last 5 years the large university libraries in Denmark have made their catalogues available on-line. Of importance to medical literature tracing we could mention the SOL, ODIN, COSMOS, REX etc. These bases contain the stock of the university libraries, both books and periodicals, but literature bought before the creation of the bases must still be searched in the old card catalogues. Looking at the Danish system, one could say that it had been better from both an economical and a working point of view to stake on the union catalogue system only.

Looking at the other data bases for location in Scandinavia, we find the LIBRIS in Sweden. This base contains foreign literature in Swedish research libraries from 1968 as well as the Swedish national bibliography from 1976. Furthermore, the base contains the NOSP, the Nordic union catalogue of periodicals. In Norway the situation is very similar to that in Denmark with more than one system. UBO:BOK and UBO:SKP contain the Norwegian national bibliography from 1971 as well as foreign books from 1983 and periodicals from 1968 placed in about 350 Norwegian research libraries. BIBSYS is another important base registrating the stock since 1980 in 6 large and several smaller libraries. In Finland, especially the base KANKO is of importance to the Danish medical libraries. It contains the holdings from 20 large research libraries since 1980 and only not-Finnish literature is registered.

The Danish librarian faces a varied picture when providing location of a document on-line: varying content, different command languages, various entry and payment conditions etc. During the last 10 years Scandinavian library catalogues have become easy and swiftly accessible, but at the same time possibilities of using new technologies have become limited. That is why it is so important to try to solve one of our main problems, i.e. the many various command languages.

The Nordic joint project IANI was started with the purpose of meeting this problem. IANI means: intelligent access to Nordic information systems. It aims to stimulate use of Nordic data bases, to stimulate use of standards at

any level, to stimulate on-line ordering in Nordic libraries, to make guidelines for future data bases and avoid duplicate registration. IANI is so new that it is still too early to tell how well it is going to function.

In Denmark the implementation of the computers in the daily routine in the libraries has gone slowly. Neither the public libraries nor the research libraries have been able to cooperate. As for the medical libraries the administrators of the hospitals are to blame for the slow development. The hospital managers have been hesitant to introduce new technologies in the hospitals. We do not doubt the fact that small grants increase the interlibrary loans. However, this factor is not the only one of importance. The new electronic systems have given access to much information, but also to knowledge of the holdings of a wide range of libraries. Of course, the automated locating bases influence the routings of request. This has caused changes in formerly written and unwritten interlending rules. But let us look at the price policy. How has this influenced the routing of the interlibrary lending?

Firstly, must we pay for the photocopies, which are delivered instead of the proper document? Secondly, what is the price for the use of the external data base?

Referring to the first question there is, of course, no doubt that the libraries want to get the copy free of charge. Small libraries deliver copies free of charge, but must pay for their copies to the large libraries. If a small library can make a clearing arrangement with a large library, the interlibrary loan procedure is unduly delayed resulting in great inconvenience to the end-user.

The price policy of the database producers greatly influence the small medical libraries' ability to use the automated localization systems. Normally we pay for the time of connection. This is a fair arrangement in which all libraries are able to pay the expenses, if, of course, they know how to use the system in a suitable way. Unfortunately, some vendors charge us a large connection fee and/or yearly subscriptions of a size that the small libraries are unable to pay. Besides, this price is out of all proportion with the number of searchings the small libraries perform during a year. The only way to avoid this fee is to request through a large research library - resulting in delayed delivery. These requests are, however, troublesome to the large libraries, too.

A contributing factor to the distorted routing of the loans is the input of accessions in the local bases. This subject is discussed in Denmark at the moment. Generally, small libraries buy documents much faster than the



large ones, and small libraries also report their current accessions as soon as the documents are ready for use. Therefore, the documents from small libraries are "visible" long before those from large libraries. Owing to this, small libraries get heavy requests for the new titles the first year after the publication. They actually are forced to answer a disproportionate number of requests - a work load that they are unable to meet. Publications originally bought in order to fulfil the wishes of the staff in a hospital in this way are not available in the institution. This situation is unacceptable, to the library as well as to the in-house staff. In Denmark we have experienced that small libraries are quick to deliver, while the university libraries often deliver very slowly. Also this is forcing the loan requests towards the small libraries - we all try to get the best (and fastest) service.

In the beginning, we stated that the interlibrary loan requests have increased heavily during the last years. In this paper we have tried to analyze the reasons for the increased distortion of the routing of the loans. We have also tried to show why libraries no longer feel obliged to use the hitherto accepted protocols for interlibrary lending. We can conclude that this change is a heavy burden on small libraries. The reason is that these libraries get their documents catalogued very fast and answer loan requests very rapidly.

In Denmark small medical libraries have difficulties making both ends meet. Generally small libraries wish to participate in the interlibrary lending as equal members. It must, however, be understood that all libraries must discipline themselves, and especially the ethics are important. One should not satisfy the borrower only and not care about how the materials are obtained - for instance, always from "the fastest". A librarian should not uncritically procure everything, but carefully estimate the inconvenience to the lending library. Otherwise, the consequences might easily be that small libraries "hide" their documents until their own users have finished their current interest in the document, one might even be tempted to refuse loans. Both solutions would be undesirable. In connection with the improved possibilities of locations, a librarian might also consider whether a loan is relevant. Interlibrary loans are not a question of quantity but of quality. The quality must be noticeable in the way we localize our materials, but also in the delivered information. The increasing expenses connected with the interlibrary loan service mean that we must become aware of the term "information pollution". Because of the possibilities in "on-line"

searching it is easy to understand that our borrowers want to get more information. Therefore, the librarians must instruct so the result the users get is "value-added" and not frustration of location in the librarian.

Two years ago, at a conference dealing with interlending services in Denmark, The National Librarian quoted the following goals for a Danish interlending policy:

- To provide an optimal service level for users with a minimum of delay and with immediate information about status of lending of the wanted material.
- To minimize expenses for libraries in the interlibrary lending cooperation.
- To establish a lending cooperation based on reciprocity, preferably without money between libraries.
- To provide an optimal utilization of the gathered resources.

These are words which touch every librarian of a small library deeply - but how will it work in practice? The Office of the National Librarian is trying to avoid that some libraries, for fear of not complying with the demands of their users, keep out of the cooperation of the union catalogue. The goals of the interlending services must include as few restrictions as possible - and this point brings us back to ethics once more. Librarians should certainly use the facilities of the automated interlending network - but not abuse it. If the goals of the Office of the National Librarian holds water, the future interlibrary loan system will be extremely unbureaucratic. The demand of a fast document delivery cannot cooperate with the restrictions and hierarchical structure of the referral system.

The librarians in the small libraries must make demands for the future, which will enable us to raise the service level of the libraries. It is not very likely to imagine that libraries will get more staff. Instead we will have to claim for better chances to do a qualified work, e.g. through better possibilities of access to more well-functioning bases.

Access to localization bases with an unhomogeneous content will give a low level of service. It will be necessary to put demands to the vendors as regards exact information about the in-put of the participating libraries, in the present as well as retrospectively. At the same time we will have to demand a common command language, in order to make it possible for the staff of a small library to make localizations. Price policy must be improved so that small libraries can afford to participate. So: no regular fees, payment only for time connected. Librarians have to demand common in-

logging procedures and a network which will secure that it is practical to search for all possibilities in one in-logging according to an already determined route, defined on the basic needs of every single library. There is every reason to believe that this will come true in the near future. Research on IANI gives us a reason to hope that very soon small libraries will be connected to all Nordic bases.

Most of our paper has been used to enumerate the problems that have arisen as a consequence of the automated localization systems. Our contribution may be seen as one long lamentation about all the trouble that new technology has created for - especially - small libraries. That was not the intention. It is our feeling that development during the latest years to a great extent has increased the possibilities of the librarians of quick and exact tracing of relevant documents - a development which has been to the advantage of our users and has contributed to the change and improvement of the image of the libraries. We have merely wished to focus on certain consequences of this development. These blemishes can, with determination and energetic cooperation, be turned into an even more positive future of the interlibrary loan service of the libraries.

#### References

- Abbot, P. and R. Kavanagh. Electronic Resource sharing changes interloan patterns. *Library Journal*. 111 (16): 56-58, 1986
- Berg Hansen, I. BDI-sektoren år 2001. *DF-Revy*. 11 (5): 132-136, 1988
- Blume, P. Informationsdød? *DF-Revy*. 11 (3): 65-67, 1988
- Caspersen, H. Status for DABL. *Statsbiblioteket. Interne Meddelelser*. 26 (11): 186-191, 1988
- Harder Rasmussen, J. Hvordan skal informationspolitik forvaltes? *DF-Revy*. 9 (3): 33-36, 1986
- Jall, O. Store/små forskningsbiblioteker. *DF-Revy*. 10 (3): 67-70, 1987
- Jørgensen, H. Nostalgi og fremmedlån. *Bibliotek 70*. No. 6: 236-237, 1988
- Knakkegaard, L. DABL-erfaringer. *DF-Revy*. 10 (2): 32-34, 1987
- Laursen Vig, M. Fremtidens låneveje. *DF-Revy*. 10 (2): 25-28, 1987
- Mark, N. Forskningsbibliotekerne ved årtusindskiftet. *DF-Revy* 11 (5): 130-131, 1988
- Nørhede, A. Alt i baserne? *DF-Revy*. 10 (2): 34-35, 1987
- v. Hielmcrone, H. Praktiske hjælpemidler i lånesamarbejdet. *DF-Revy*. 10 (4): 81-84, 1987
- Østergaard Bertelsen, J. Lånesamarbejdet - en god tradition eller bare en gammel vane? *Statsbibliotek. Interne Meddelelser*. 26 (11): 194-202, 1988