

Information Technology and Libraries

June 1984

CONTENTS

- 109 Online Information Services, Document Delivery Systems, and Libraries in the Federal Republic of Germany *K. W. Neubauer*
- 131 RLIN Product Batch: Fundamental Design Concepts *Walt Crawford*
- 144 Special Section: ILS and LS/2000
- 144 The Integrated Library System: A Historical Overview *Richard S. Dick*
- 149 The ILS—The Pentagon Library's Experience *Ruth Mullane*
- 162 LS/2000—The Integrated Library System from OCLC *Susan Olson*
- 174 Communications
- 174 ODIN: A Multifunction, Multitype Library Microcomputer Network *Charles T. Townley*
- 178 The Clemons Library Reserve Circulation System: A Model for Distributed Processing in Library Networks *David T. Buxton*
- 184 Reports and Working Papers
- 184 Proposed Standard Purchase Order, Variable Format for the Computerized Ordering of Books *Subcommittee U, National Information Standards Organization*
- 209 News and Announcements
- 215 Recent Publications
- 215 Reviews
- 215 Buckland, Michael K. *Library Services in Theory and Context*, reviewed by Michael Gorman
- 216 Fayen, Emily Gallup. *The Online Catalog: Improving Public Access to Library Materials*, reviewed by Sandra K. Ready
- 217 Walton, Robert A. *Microcomputers: A Planning and Implementation Guide for Librarians and Information Professionals*; Keren, Carl; Perlmutter, Linda, eds. *The Application of Mini- and Micro-Computers in Information, Documentation and Libraries: Proceedings of the International Conference on the Application of Mini- and Micro-Computers in Information, Documentation, and Libraries, Tel-Aviv, Israel, March 13-18, 1983*, reviewed by William Gray Potter
- 220 Whiffin, Jean. *Union Catalogues of Serials: Guidelines for Creation and Maintenance, with Recommended Standards for Bibliographic and Holdings Control*, reviewed by Crystal Graham
- 222 Other Recent Receipts
- 213 Index of Advertisers

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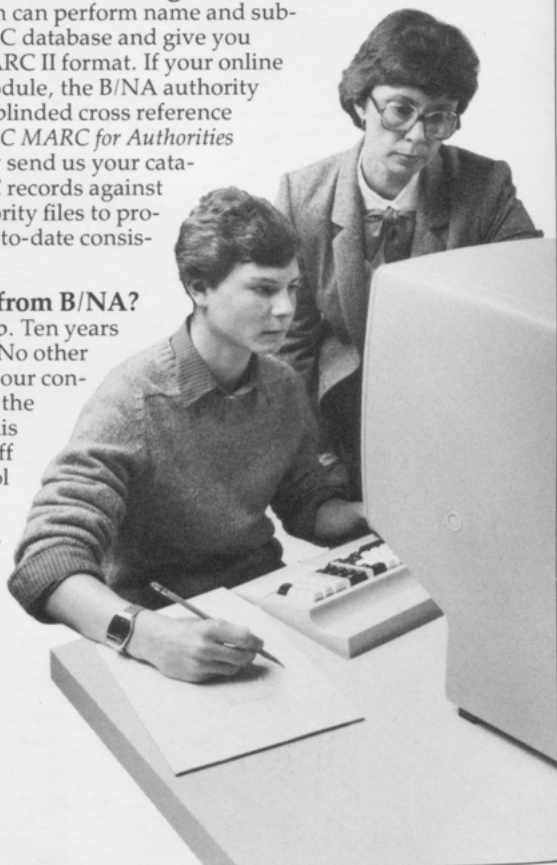
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- 144 The Integrated Library System: A Historical Overview *Richard S. Dick*
- 149 The ILS—The Pentagon Library's Experience *Ruth Mullane*
- 162 LS/2000—The Integrated Library System from OCLC *Susan Olson*
- 174 Communications
- 174 ODIN: A Multifunction, Multitype Library Microcomputer Network *Charles T. Townley*
- 178 The Clemons Library Reserve Circulation System: A Model for Distributed Processing in Library Networks *David T. Buxton*
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Information Technology and Libraries is the official publication of the Library and Information Technology Association, a division of the American Library Association, 50 E. Huron St., Chicago, IL 60611; *Executive Director*: Donald P. Hammer. The journal is issued quarterly in March, June, September, and December.

Information Technology and Libraries publishes material related to all aspects of library and information technology. Some specific topics of interest are: Automated Bibliographic Control, AV Techniques, Communications Technology, Cable Systems, Computerized Information Processing, Data Management, Facsimile Applications, File Organization, Legal and Regulatory Matters, Library Networks, Storage and Retrieval Systems, Systems Analysis, and Video Technologies. *ITAL* welcomes unsolicited manuscripts. Submissions should follow the guidelines stated under "Instructions to Authors" on page 80 of the March 1982 issue.

Manuscripts of articles, communications, and news items should be addressed to: William Gray Potter, Editor, *Information Technology and Libraries*, 246 A Library, University of Illinois, 1408 W. Gregory Dr., Urbana, IL 61801. Copies of materials for review should be addressed to: Karin A. Trainer, *ITAL Book Reviews*, Yale University Library, 120 High St., P.O. Box 1603A, Yale Station, New Haven, CT 06520. Advertising arrangements should be made with William Z. Schenck, University of Oregon Library, Eugene, OR 97403.

Information Technology and Libraries is a perquisite of membership in the Library and Information Technology Association. Subscription price, \$12.50, is included in membership dues. Nonmembers may subscribe for \$25 per year. Single copies, \$7.50.

Circulation and Production: American Library Association, 50 E. Huron St., Chicago, IL 60611. Please allow six weeks for change of address.

Publication of material in *Information Technology and Libraries* does not constitute official endorsement by the Library and Information Technology Association or the American Library Association.

Abstracted in *Computer & Information Systems*, *Computing Reviews*, *Information Science Abstracts*, *Library & Information Science Abstracts*, *Referativnyi Zhurnal*, *Nauchnaya i Tekhnicheskaya Informatsiya*, *Otdyelnii Vypusk*, and *Science Abstracts Publications*. Indexed in *Computer Contents*, *Computer Literature Index*, *Current Contents*, *Current Index to Journals in Education*, *Education, Library Literature*, *Magazine Index*, and *NewSearch*. Microfilm copies available to subscribers from University Microfilms, Ann Arbor, Michigan.

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Second-class postage paid at Chicago, Illinois, and at additional mailing offices. *Postmaster: Send address changes to Information Technology and Libraries, 50 E. Huron St., Chicago, IL 60611.*

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(Partial list including panelists)

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John Blair
Richard Boss
John B. Corbin
Richard DeGennaro
Susan B. Epstein
Richard Goldberg
Marian Huttner
Caryl McAllister
Rob McGee
James E. Rush
Stephen Salmon
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DataPhase

MAIN TOPICS

Plenary Sessions:
Telecommunications and linkages
Interfacing local area networks
Distributed processing
Administrative issues (consortium environments, multi-type, multi-location systems)
Microcomputer systems

Breakouts:

- Track 1. Planning (selection, evaluation, etc.)
- Track 2. Administering/managing (LCS experience, etc.)
- Track 3. Technical (Unix system, etc.)

CALL FOR PAPERS

All aspects of integrated online library systems (library systems that use a common machine readable database and have two or more subsystems such as acquisitions, circulation, public catalog, etc.). Related peripherals and new or developing systems, data conversion, interfaces, et al. All types of libraries (academic, federal, public, special, state, etc.). Papers will be selected by a review committee of librarians.

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Online Information Services, Document Delivery Systems, and Libraries in the Federal Republic of Germany

K. W. Neubauer

This paper begins with a short survey of the present situation and the services available. The problems and advantages of international cooperation with online information services and document delivery systems are discussed. The Federal Republic of Germany is naturally part of, and dependent on, the international (especially the European and the U.S.) information scene. This dependence may grow and become a danger. Relationships with the other countries in Western Europe and European Community activities are considered. There is further discussion of aspects of the strong influence of U.S. industries on the European and German information market and the question of the free flow of information.

INTRODUCTION

The structure of the information services in the Federal Republic of Germany consists—as in other countries—of two principal parts: (1) libraries and documentation and (2) information services. The development of these two parts has been very different. In latter years there have been efforts to coordinate both and to combine online information services with document delivery systems by libraries. The library services are mainly nationally oriented; the information services are very much influenced by, and dependent on, foreign systems. Online information services, especially the commercial services, are trying very hard to get their share of the information market in the different countries. The development of data communication and transportation in the last ten years has opened effective and relatively cheap possibilities for all kinds of worldwide online access to databases, especially via satellite

and by fibre optics techniques. On the other hand document supply still depends mainly on the transportation of copies by normal mail services; this means document delivery systems work on a local or national scale, normally not on an international scale. This will change when more document delivery is done by telecommunication, teleordering, and full-text storage. Here, too, new telecommunication techniques will allow fast and cheap national and international transportation of documents by telecopying, etc.

Especially with reference to online information services, the Federal Republic is very much connected with the activities of the European Community. Europe as a whole depends very much on the U.S. information industry, which is in some ways superior to its European counterpart. Great efforts have been made by the European Community and by the federal government of Germany to compete with the

Americans and to become more independent. These efforts have been only partially successful.

ONLINE INFORMATION SYSTEMS AND THE ONLINE INFORMATION MARKET

Here we refer only to online information services and databases because we think that online information is the most important characteristic of information systems in the computer age. Development in this area has been extremely fast in the last few years in the industrialized countries. We will discuss the situation in the Federal Republic first, then its relationships within Europe and to the United States.

Survey of the Situation of Online Information Systems and the Online Information Market in the Federal Republic of Germany

This survey is not complete but we hope to include the main aspects.

The Federal Republic now has nine "hosts" publicly available.* Three other hosts supply online services to a limited public. There are about forty to fifty other hosts which are mainly for in-house use and are not publicly available online (31, p.63-65;33).† The nine publicly accessible hosts are the following:

- DIMDI (Deutsches Institut für Medizinische Dokumentation und Information—German Institute for Medical Documentation and Information in Cologne)
- INKA (Informationszentrum Karlsruhe—Information Center Karlsruhe, in Karlsruhe)
- FIZ Technik (Fachinformationszentrum Technik—Information Center for Technical Sciences in Frankfurt)
- GID (Gesellschaft für Information

*We define *host* as a computer center offering online databases mainly, but not necessarily, produced by other institutions or firms. The amount of hosts in the Federal Republic is counted differently in different publications, depending on whether a host is considered for public or mainly internal use.

†Editor's Note: The author's references and style of reference citation throughout this article have been accepted essentially as submitted.

und Dokumentation—Documentation and Information Society in Frankfurt)

- DBI (Deutsches Bibliotheksinstitut—German Library Institute, in Berlin)
- Hoechst (a large chemical concern in Hoechst near Frankfurt)
- VWD (Vereinigte Wirtschaftsdienste—stock exchange data, in Eschborn)
- INFAS (Institut für Angewandte Sozialwissenschaft—Institute for Applied Social Sciences, in Bonn; data of German and European elections)
- CMS (Coordinierte Management Systeme in Frankfurt—econometric data on OECD countries)

The three other hosts available to a limited public are:

- JURIS (a juridical database at the Federal Minister of Justice in Bonn),
- Gruner & Jahr (a newspaper database in Hamburg), and
- DATEV (a tax database in Nürnberg)

There are still no big databases publicly available which are produced by big publishers. Publishers still hesitate to enter the online information market.

Six hosts are publicly run or publicly supported (DIMDI, INKA, FIZ Technik, GID, DBI, JURIS), among which are the three biggest hosts for scientific technical information in the country. These are DIMDI, FIZ Technik, and INKA. INKA is a technical computing center offering its services on behalf of different information systems, including FIZ Technik, whereas DIMDI offers technical computer services in combination with the databases on its own account.

DIMDI is the biggest German host, offering more than thirty databases with twenty-two million records in the field of biosciences, of which seven are factual databases. In 1983 there were about sixty thousand searches with eighteen thousand connect hours. Fewer than 50 percent of the searches come from outside of Germany. DIMDI in 1983 spent about twenty-four million DM, out of which about three million DM are collected from the users. The rest is paid mainly by the federal government.

INKA offers the databases of the Information Center for Energy, Physics, and

Mathematics with sixteen bibliographical databases and six numeric and factual databases; of the Information Center for Materials with six databases (of which two are factual databases); of the Information Center for Civil Engineering with seven databases; and of the Information Center for Raw Material and Geosciences with one database. The FIZ Technik offers seven databases in different fields of technical engineering and technical sciences.

The five information centers using INKA as a technical computer center offer together about fifty databases with twelve million records. In 1983 they had a budget of about eighty-six million DM, out of which 80 percent was paid by the governments, mainly the federal government.

The Information Center for Energy, Physics, and Mathematics, which is part of INKA, has linked its online computer information services with the Chemical Abstracts Services (CAS) of the American Chemical Society in Columbus, Ohio, as a result of a several million dollar contract signed in autumn 1983 and paid by the federal government. The two computer systems are linked by a dedicated telecommunication line and use CAS software so that the same command language can be used for searching information files at both locations. Under the network arrangements, a particular database will be loaded only by one center, eliminating duplication in file storage and updating costs. The searcher can access the nearest host computer and can be switched automatically to another computer in the network which stores the database to be searched. The network is one comprehensive system for the searcher. According to this contract, the German Information Center in Karlsruhe will offer the whole set of CAS online substance search services which have been offered up to now exclusively from Columbus. Some German databases, e.g., the *Physikalische Berichte* will be accessible for North American users through Columbus. The service started at the end of 1983 and will be extended during 1984. It is the first network arrangement between a German and an American host.

The GID and the DBI are the smallest government-supported hosts. The GID of-

fers more than ten databases in the fields of food sciences and libraries and documentation. The DBI offers three library databases (mainly serial databases of the national serial data system).

In addition to these hosts located in the Federal Republic of Germany, use is made of hosts in other European countries and in the United States. Information searches from Germany to the United States are mainly done through Dialog Information Retrieval Services, offering about 150 databases with more than fifty million records; SDC (System Development Corporation), offering about 70 databases in chemistry, pharmacy, energy, and patents; and BRS (Bibliographic Retrieval Services), through their European branch, Data-Star, in Switzerland. Data-Star offers sixteen databases in chemistry, biosciences, and economics.

Of the European hosts, the main ones used by Germany are ESA-IRS, which is the information center of the European Space Agency in Italy and which offers more than thirty databases with almost twenty million records (it is believed to be the third largest online information center in the world); the French system *Télesystèmes-Questel*, which is something like the national host of France, offering about thirty-five databases, mostly French; the British system *Pergamon Infoline (26)*, with thirteen databases and about four million records; and *Derwent-SDC Search Service* (a cooperative venture with the U.S. host SDC), with eight databases.

According to the latest survey, done with the support of the Federal Ministry of Research and Technology in 1982, there are 319 online databases accessible in the Federal Republic containing scientific, technical, and economic information (31). These databases are provided by thirty-three hosts, offering one or more databases each. It is especially interesting to note the countries in which these databases are produced. Table 1 shows that not even 10 percent of the databases used in the Federal Republic are produced in the Federal Republic. Almost half of the databases come from the United States and more than a quarter from France and Britain, mostly from France. The 8 percent of databases

Table 1. Distribution of Databases Accessible in the Federal Republic, Relating to the Country of Producing Institutions

Country of Producers	No. of Databases	Percent
U.S.A.	150	47.0
France	58	18.0
Great Britain	34	10.5
Federal Republic of Germany	27	8.5
Luxemburg	26	8.0
Italy	7	2.0
Netherlands	6	2.0
Belgium	5	1.5
Austria	3	1.0
Switzerland	1	0.5
Canada	1	0.5
South Africa	1	0.5
12 producing countries	319	100.0

Source: Schulte-Hillen (31), p.40.

coming from Luxemburg are produced by the European Community, headquartered in Luxemburg. According to the Inspec study (33), in the Federal Republic about eighty other databases were established in 1981, but most of them are not available online and/or are used mainly for in-house purposes. About 80 percent of the databases produced in the Federal Republic are bibliographic databases.

As to the size of the market for online services in the Federal Republic, the figures are not really clear (see figure 1). The German survey mentioned above (31, p.100) estimates about nine million DM for 1981 and assumes a similar figure for 1982.

While it is not possible to obtain a reliable figure for the present online market and the market of latter years, it is even more difficult to get a reliable estimate for the future. Certainly there will be a heavy increase in the online market.

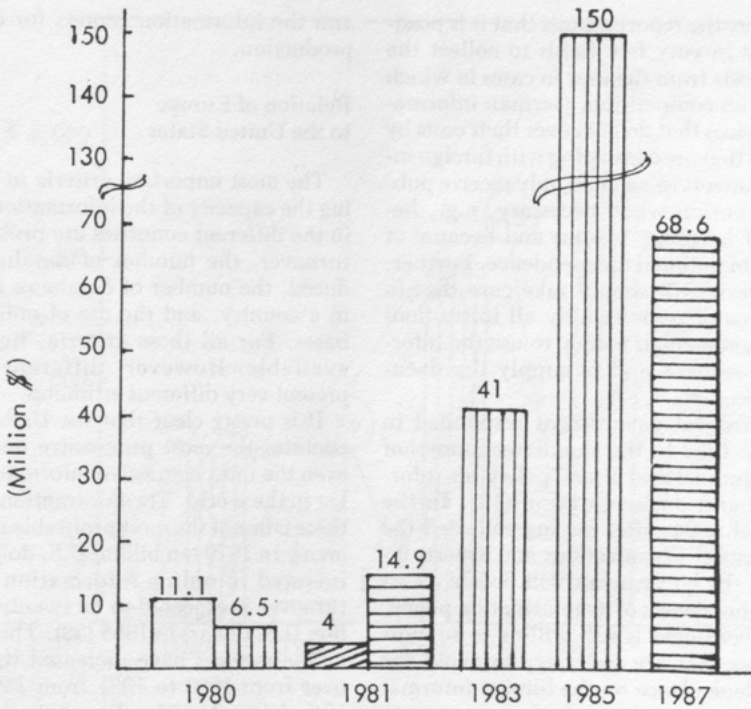
The Input study estimates the German online market in 1985 as up to 150 million U.S. dollars (see figure 1), a figure which probably will not be reached. The same study prophesied a market size of 41.1 million U.S. dollars for 1983. The reality has been far behind this figure.





Government and commercial use each constitute about half of the total use of on-

line services. Government use usually concentrates on national hosts and databases. Commercial use (e.g., users from industrial research) is usually by large firms. Small firms with less than a fifty-million-U.S.-dollar turnover almost never use online information services. About half of the searches are done directly with hosts of the United States, and two-thirds of these are done through Dialog and one-third through SDC (31, p.87 ff).

The influence of the government on the database production is very great. Most of the twenty-seven databases mentioned in table 1 which originated in the Federal Republic are produced by the so-called subject information centers (Fachinformationszentren). These have been established as part of a federal information program of 1975 (27). The federal government spent, especially in the 1970s, a considerable amount of money on this program. The purposes of the program have been to increase German input into databases, to support export of information services, to establish information services for all subjects, to improve and make commonly available all kinds of information services, and to establish an information network between information centers, libraries, and publishers. As already mentioned, the federal government still subsidizes the activities of the main hosts and database producers mentioned above. However, of the twenty subject information centers planned in the original program, only thirteen actually exist. First, industry resisted participation in a national information system dominated by the government, and second, the government ran out of money because of the economic recession. Instead of the some 100 million DM that the government spent in former years for the program, it spent only about 123 million DM in 1983. At the end of the 1970s the government tried to establish a national information network called ODIN. This network never came into existence. The main hosts started their test service in the 1970s free of charge but now have to charge the user.

In the meantime the Federal Auditing Office (Bundesrechnungshof) checked the results of the federal information program



-  Frost und Sullivan
-  Input
-  Schulte-Hillen
-  IDC

Source: Frost and Sullivan (9), Input (25), Schulte-Hillen (31), IDC (15).

Fig. 1. Online Information Market in the Federal Republic of Germany According to Different Studies.

and submitted a detailed report to the federal government in April 1983 (14). The Bundesrechnungshof urges the government to give up some parts of the scope of the former program. The government should see that it is not able to coordinate, regulate, and organize the whole market for information and documentation, not even the main parts of it. The federal government should find out which subjects and which parts of the market should be left completely to private initiatives and firms.

The government should further find out in which areas it should directly finance or run information services, in which areas the whole market should be left to private firms, and where the government should support private initiatives. Naturally, the Bundesrechnungshof requires the government to attend to cost-effectiveness and check the needs of the market precisely. Further, the Bundesrechnungshof requests the government not to offer services where foreign services are already available.

However, the report admits that it is possible only in very few fields to collect the whole costs from the user in cases in which there is no competition. German information services that do not cover their costs by fees and that are competing with foreign information services should only receive public subvention when necessary, e.g., because of language reasons and because of reasons of national independence. Further, the government should take care that in their area of responsibility all institutions should get enough money to use the information systems and to supply the documents needed.

The federal government responded in October 1983 to the Bundesrechnungshof report and defined a new policy for information and documentation (12). In the course of 1984, after having collected the comments of organizations and experts involved, the government will decide about the further details of its information policy. The government is still willing to support activities that are necessary to avoid too much dependence on the foreign information industry. At the same time, it wants to promote private competition. The government admits that subventions could have hindered the development of a well-functioning private information market. It considers as finished the initial phase for bibliographic databases in which services are delivered free of charge. Even if it is impossible to collect all costs for online information from the user, the main direction for the next years is at least to charge the user for the output costs. The federal government will generally not engage in the market of economic and management databases except in special cases when support for the development of databases is necessary. It will try to improve the conditions of the German information market and will concentrate its efforts on information systems in natural sciences, engineering, and biosciences. It will, naturally, continue the information services of the different ministries. It now stresses closer cooperation between libraries and information services and supports development of online services in libraries. It will continue to subsidize the two governmentally subventioned main hosts (INKA and DIMDI)

and the information centers for database production.

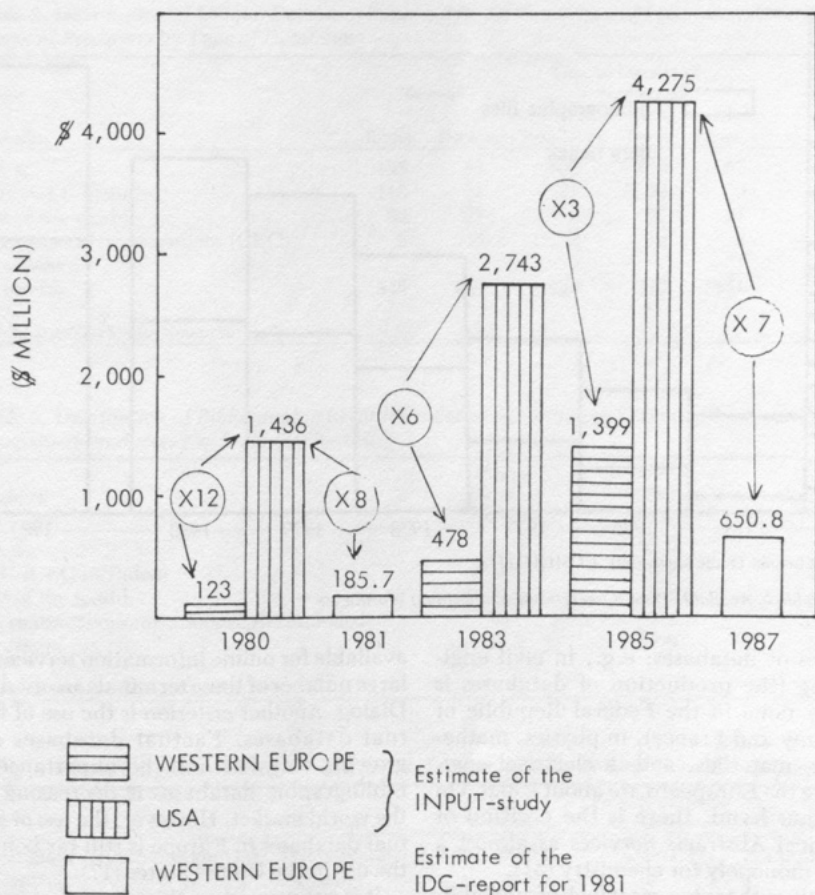
Relation of Europe to the United States

The most important criteria in comparing the capacity of the information market in the different countries are probably the turnover, the number of databases produced, the number of databases available in a country, and the use of online databases. For all these criteria, figures are available. However, different surveys present very different estimates.

It is pretty clear that the United States contains the most progressive and maybe even the most aggressive information market in the world. The information industry there is one of the most profitable industrial areas. In 1979 ten billion U.S. dollars were invested in online information and the turnover is expected to be twenty-five billion U.S. dollars in 1985 (32). The big U.S. online services have increased their turnover from 1980 to 1981 from 150 million U.S. dollars to 332 million U.S. dollars, an increase of more than 30 percent. The amount of clients increased in the same period by 50 percent (IDP Report, 16).

Figure 2 shows the relation of the size of the online information market in Western Europe and the United States according to two important surveys (Input study, 25; IDC report, 15). According to the Input study, the turnover of the American market in 1980 was more than twelve times that of Western Europe. In 1985, the turnover is expected to be three times that of the European. Using the figures of the IDC report for Western Europe and the figures of the Input study for the United States, the U.S. market will continue to be about eight times bigger than the European.

The latest edition of the EUSIDIC (European Association of Information Services) *Data Base Guide* of 1983 (11) shows about 1,500 databases available to the public in the whole world. There are an estimated 1,150 databases accessible online, leaving some 350 waiting to be put on the disk of a host computer for online access and interactive searching. Figure 3 shows the increase of the amount of databases



Source: Input (25), IDC Report (15).

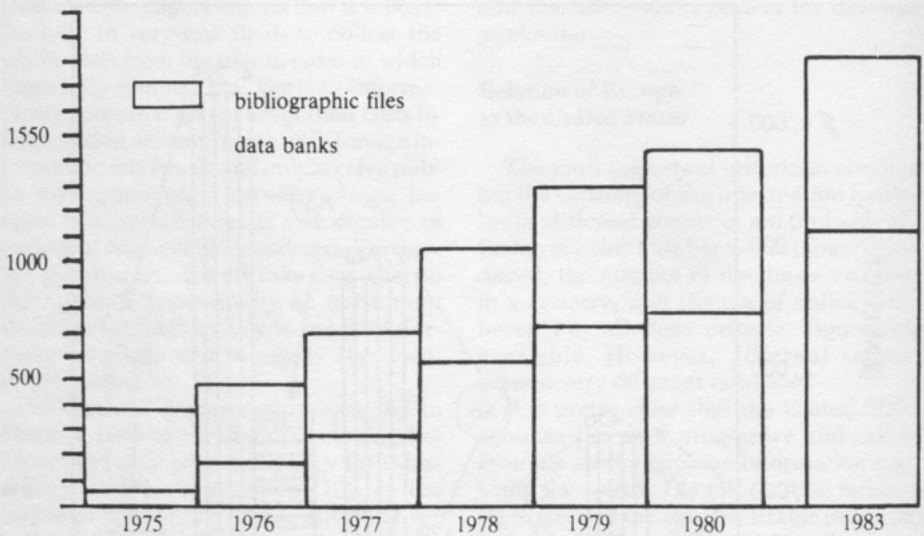
Fig. 2. Comparison of the European and the U.S. Online Market (1980-87).

since 1975. The growing percentage of factual databases is evident. In 1983 factual databases constituted more than 50 percent of all databases.

The Commission of the European Community made a compilation in 1982 of the countries of origin of 1,026 databases (see table 2). Of these databases available to European online information users, 56 percent are produced in the United States and 26 percent in the European Community member countries. In spite of the big increase of the European databases from 5 in 1975 to 265 in 1982, the Europeans still are far behind the United States, which has 570.

The breakdown of the production of rec-

ords shows the overwhelming position of the United States (table 3). The U.S. produces 3.5 times more records than the countries of the European Community. The average size of European bibliographic databases is less than 40 percent of their American counterparts. It should be noted that the private sector in the United States produces about 45 percent of all the American output of bibliographic references; in Europe, it is estimated, the private sector produces only 25 percent of such records. Further, the percentage of factual and numeric databases in the United States is more than 70 percent; in Europe, a bit more than 50 percent. Only in a few subjects does Europe resist American superiority in the pro-



Source: Euronet Diane News (5b), EUSIDIC (11).

Fig. 3. Publicly Available Data Bases (Online and Offline) Worldwide.

duction of databases; e.g., in civil engineering (the production of databases is mainly done in the Federal Republic of Germany and France), in physics, mathematics, materials, and in electrical engineering the Europeans are about equal. On the other hand, there is the position of Chemical Abstracts Services as almost a world monopoly for chemistry (31).

Further, there is a great lack of availability of databases in Europe compared with the United States. For example, all EURONET hosts together make available about four hundred online databases; in the United States more than twice as many are available (5b). Naturally, the different size of the U.S. information market causes different sizes of hosts as compared to Europe. Table 4 shows the size difference of some large U.S. and European hosts. The whole German online information market is much smaller than the volume of one big American host.

It may give some impression of the use and, at the same time, of the completely different rate of acceptance of online services to mention that Dialog has about fifty thousand terminal connections worldwide, and the whole Federal Republic has only a few hundred terminals to hosts publicly

available for online information services. A large number of these terminals are used for Dialog. Another criterion is the use of factual databases. Factual databases are growing very fast and the importance of bibliographic databases is decreasing on the world market. However, the use of factual databases in Europe is still far behind the use in the United States (17).

It is not surprising, therefore, that in the 1980s the marketing of European databases in the United States is in a similar position to that of the U.S. database market in the 1970s. To check the changes and possibilities of European databases on the U.S. market, the Bridge Project has been initiated by the Commission of the European Community (5d). As an experiment, six European hosts have been opened to a group of twenty American information brokers to sell their services directly to the end customer in the United States. In this recent pilot assessment the American consulting firm Cuadra Associates, Inc., has been asked to provide a help desk and record the reaction of users.

The main problems are the same as home-grown databases faced in the earlier days of the developing U.S. market—making people acquainted with what is

Table 2. Distribution of Unique Databases Produced by All Categories of Producers, According to Origin of Producers by Type of Databases

Origin of Producers	Type of Databases					All Categories of Databases
	Textual		Numerical			
	Biblio.	Factual	Mixed Text/Num.	Time Series	Other Numeric	
U.S.A.	155	83	105	140	87	570
EEC (CEC included)	113	71	21	29	30	264
Rest of the world	69	27	6	27	31	160
International organizations (CEC excluded)	8	3	2	16	3	32
All origins	345	184	134	212	151	1,026

Source: Euronet Diane News (5a), p.7.

Table 3. Distribution of Bibliographic Records Produced According to Origin of Producers by Category of Producers ($\times 1,000,000$ Records)

Origin of Producers	Private Database Producers	Public of Non-profit Database Producers	All Categories of Producers
U.S.A.	33.2	41.9	75.1
EEC (CEC included)	4.9	16.3	21.2
Rest of the world	0.8	6.2	7.0
International organizations (CEC excluded)	—	1.5	1.5
All origins	38.9	65.9	104.8

Source: Euronet Diane News (5a), p.7.

Table 4. Size of Large Hosts in the United States, Europe, and the Federal Republic of Germany

USA	Volume	Europe	Volume	Federal Republic of Germany	Volume
Mead Data Central	108.5 million DM	Télesystèmes-Questel	7.5 million DM	DIMDI	2.4 million DM
Dialog	79.1 million DM	ESA-IRS	3.76 million DM	INKA/ FIZ Technik	1.6 million DM
OCLC	67.8 million DM				

Source: Schulte-Hillen (31).

available and finding the market. A particular advantage of European databases is that they cover some subjects that are not covered in depth by U.S. databases, e.g., transportation. In addition, the international coverage of European databases is an attraction. However, the European databases need changes of presentation or technical adjustments required for the American consumer. Cuadra, finally, proposes an online user group of European databases to stimulate the marketing of European databases in the United States.

All these figures and experiences have at least one common thread: The dependence

(in some cases, growing dependence) of the European information market and information industry on the United States and the main problems faced by European databases in the United States. Europe is facing serious dangers. The Europeans are afraid that the transport of data flow or the free flow of information will be limited by U.S. policy. In fact, there are signs that the information policy of the United States is acquiring some restrictive patterns that touch European interests quite heavily. The idea of an information war between the United States, Europe, and Japan is becoming credible. There are statements of

American officials that support this impression (see, for example, the statements of former Deputy Secretary of Defense F. Carlucci [4] and former Deputy Director of the CIA Admiral B. R. Inman [18]).

The consequences for developing countries are even more onerous than for Europe. For them, the development of information technology is creating yet another technological gap between them and the industrialized countries. As one French minister said, "Information is power and economic information is economic power."

Europe and the Federal Republic of Germany

In the first half of the seventies, the European Community began to develop its own online information services network with which national telecommunication agencies (PTTs) had to cooperate in order to establish hardware and software equipment for the telecommunication systems. First, a telecommunication network for the member countries of the European Community was introduced. It became operative in early 1980. Euronet was combined with the European database network called DIANE, which includes countries not in the European Community. Euronet connects the European hosts and, in this way, makes the main databases available to the European public.

The European Community has also tried to support the development of European databases. Apart from the databases produced by the European Community itself, the main impetus for the production of databases in Europe comes from national governments or private firms. In France, government influence on the production of databases has traditionally been great, but such influence is increasing, even in Britain. France is probably the most fervent supporter of information independence and thus of international cooperation on the basis of national equality in this field.

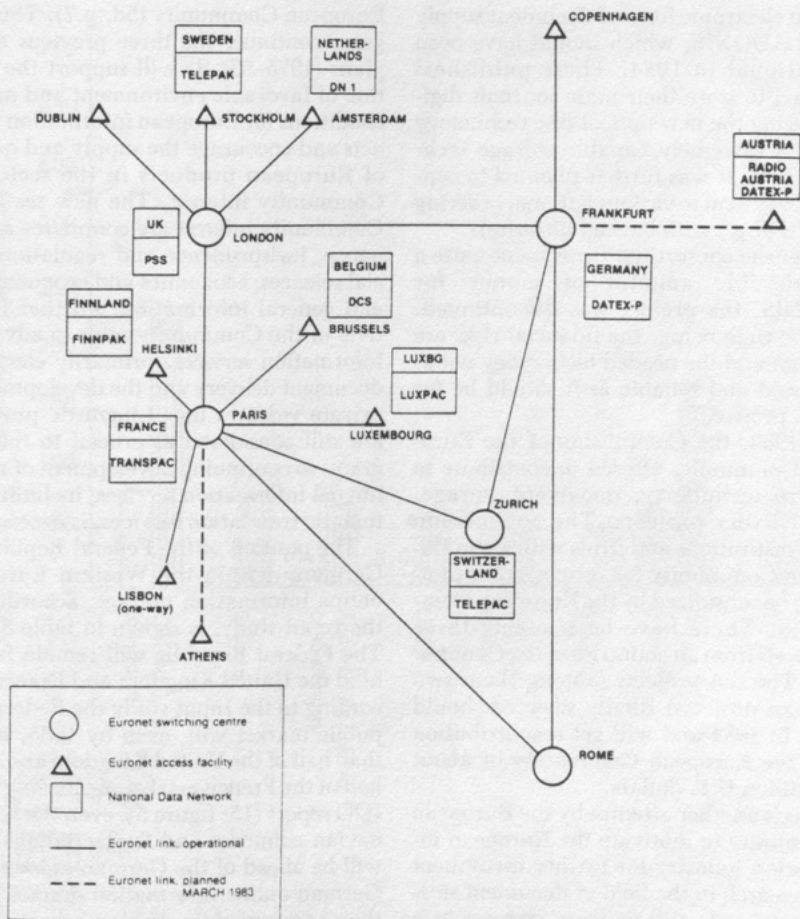
After three years of operation, Euronet/DIANE now offers almost four hundred databases (5b,p.1). The main growth has been in factual and numeric databases in the serial, legal, business, and economic information sectors (45 legal and 130 socio-economic databases are now accessible via

the network). The number of hosts has also risen from twelve to forty, including many of the largest computer service bureaus in Europe. Euronet is now offering almost 90 percent of its bibliographic databases via the DIANE command language, which allows the user to communicate with all host systems by the same language.

Since the beginning of Euronet, the traffic has increased considerably—from 10,000 calls in the first month to 332,000 calls in 1982. In 1983 there were about eighty thousand hours connect time. The increase between 1981 and 1982 has been, in terms of calls, more than 60 percent, and, in terms of hours, about 80 percent (figures taken from 5b,c).

Most of the originating traffic came from Great Britain (almost 25 percent), followed by the Netherlands, France, Germany (11–15 percent). The terminating traffic went to Italy (33 percent), followed by Britain (22 percent), France (19 percent), Switzerland (15 percent), and Germany (10 percent). While the use of hosts in Britain, France, Switzerland, and Belgium increased considerably in the last two years, the use of hosts in Germany via Euronet has been stable. The leading role of Italy in the terminating traffic has only one reason: it is the location of the European Space Agency host (ESA-IRS) in Frascati, Italy.

The future development of Euronet/DIANE will be determined by its connection to the national networks of the Western European countries. Figure 4 shows the connection of Euronet with the existing national networks. Euronet is connected thus far to the French, German, British, Belgian, Swedish, and Finnish national public data networks. In these countries users need only one connection to their national network, which automatically puts Euronet at their disposal. On the other hand, there are direct connections between the different national networks, too, so that the user can choose to use either the international network Euronet directly or, via a national network, use the direct connection between the national networks without using Euronet at all. Over thirty countries throughout the world are connected through a series of national network communication. Usually, the use of Euronet via



Source: Euronet Diane News (5b).

Fig. 4. Euronet DIANE and European Data Networks.

a national network is easier and cheaper because users need only connect to a local access point to enter a favorable distance-independent tariff line.

It is not clear how the distribution of data traffic will develop in the next few years between Euronet and the bilaterally linked national data networks. Further, it has to be recognized that the larger part of the information traffic is national or goes to the United States directly without using Euronet. For example, in the Federal Republic of Germany only about 7 percent of data traffic goes via Euronet to DIANE hosts (31, p.100). This figure may show the present limited importance of this great

European effort. Nevertheless, Euronet will be extended and technically improved (see 5d, p.7), and this may lead to more use.

The Commission of the European Community has also promoted and supported projects for electronic document storage, publication, and delivery systems. By means of advanced technology, these systems store and retrieve individual articles or pages from scientific, technical, and medical literature. The main privately financed project was originated by an international group of publishers (Academic Press, Blackwell Scientific Publications, Elsevier, Wiley Science Publishers, Pergamon Press, and Springer-Verlag). The aim

was an electronic form of document supply called ADONIS, which should have been operational in 1984. These publishers planned to store their main journals digitally using the new optical disc technology with its extremely capable storage technique (29). It was further planned to connect the system to various national ordering systems (e.g., with backup libraries).

After the consortium firms spent quite a considerable amount of money for ADONIS, the project was discontinued. For the time being, the financial risks are too high and the needed technology not as advanced and reliable as it should be for such a project.

In 1983, the Commission of the European Community offered to contribute to modern technology, document storage, and delivery projects. The commission asked institutions and firms within the European Community for proposals for projects to be subsidized by the European Community. There have been ninety-three proposals from all countries of the Community. The ten projects (among them two German projects) finally selected should begin in 1984 and will get a contribution from the European Community of about 3.5 million U.S. dollars.

This is another attempt by the European Community to motivate the European information industry for further investment and research in the field of document storage, retrieval, and delivery systems in a joint effort of publishers, libraries, online information services, and all other concerned entities.

In November 1983 the Commission of the European Community approved a new five-year program for 1984 to 1988 for development of a market of specialized information, including a forty-million U.S.-dollar financial contribution by the

European Community (5d, p.7). This program continues the three previous action plans (1975-83). It will support the creation of favorable environment and market conditions for European information products and encourage the supply and quality of European products in the sectors of Community interest. The new sectors of Community interest are commerce and finance, jurisprudence and regulations, social sciences, economics and econometrics, and general information. Further initiatives of the Community refer to advanced information services, primarily electronic document delivery and the development of private videotex use. Linguistic problems are still considered as crucial to the program, so continuing development of multilingual information services, including automatic translation services, is necessary.

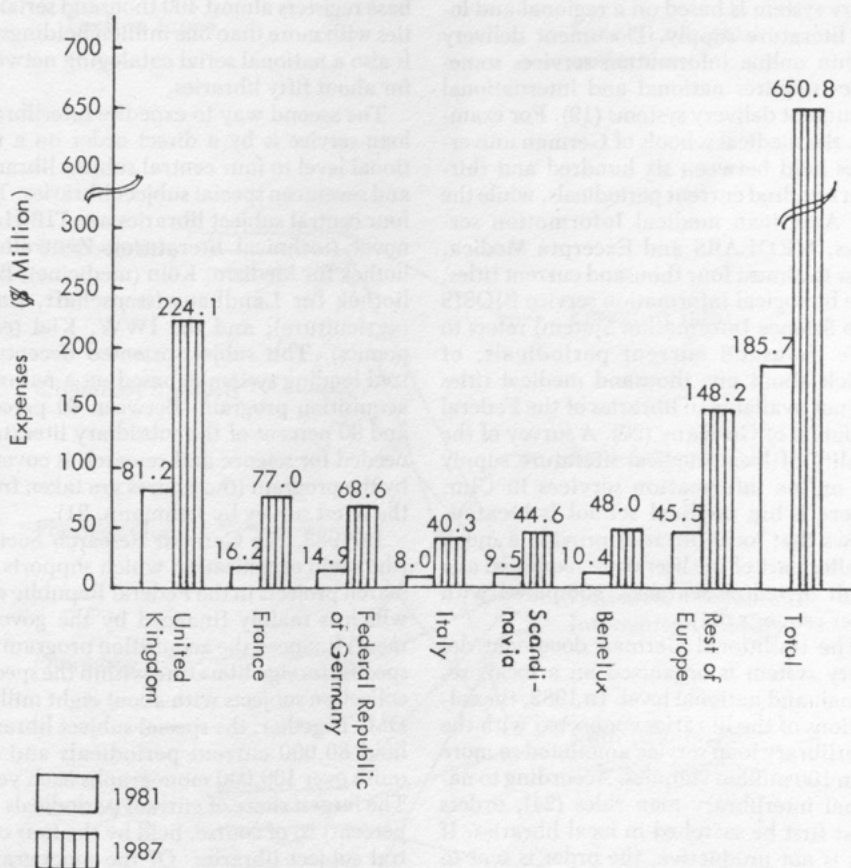
The position of the Federal Republic of Germany within the Western European online information market, according to the Input study, is shown in table 5 (25). The Federal Republic will remain far behind the United Kingdom and France. According to the Input study the Federal Republic market will, even by 1985, be less than half of the United Kingdom and about half of the French market. According to the IDC report (15; figure 5), even the Scandinavian countries and Switzerland/Austria will be ahead of the German market. The German online information market is less than 1 percent of the whole market in Western countries (12, p.15), compared with 90 percent for the United States.

The figures show that the Federal Republic has a singular lack of development in this field as compared with other Western industrialized countries. There is no complete answer as to why the Germans are so resistant to online information. Many reasons have been suggested: technical (prob-

Table 5. Prognosis of the Online Market in Western Europe (1980-85)

	Country/Expenses (\$ Million)					Total
	United Kingdom	France	Federal Republic of Germany	Italy	Rest of Europe	
1980	54	12	6.5	10	41	123
1985	397	305	149.0	110	437	1,400

Source: Input (25).



Source: IDC (15).

Fig. 5. Prognosis of the Online Market in Western Europe (1981-87).

blems with the terminal equipment, different retrieval languages, length of the searches, etc.); economic (high risk with the database production, high costs for hosts and users), etc. In fact, it is notable that publishers keep themselves almost completely out of this business. Most of these technical and economic problems happen more or less in other countries, too. Compared with the technological and economic standards of other industrialized Western European countries, the Federal Republic is in a relatively good position (this refers, too, to the telecommunication services available from the German PTT). Maybe the reasons are a combination of national mentality and federal information policy. The principal search methods of

Germans even with traditional means of information are different from those in English-speaking countries. Perhaps Germans need more time to be convinced of the use of online information technology. According to the study of Schulte-Hillen (31), the federal government has hindered the development of a functioning information market and the investment of private money and initiative by its policy of subsidizing projects and establishing too many government information services.

LIBRARIES

Problems of Document Delivery in the Federal Republic of Germany

As already mentioned in the introduction, the organization of the German li-

library system is based on a regional and local literature supply. Document delivery within online information services sometimes requires national and international document delivery systems (19). For example, the medical schools of German universities hold between six hundred and thirteen hundred current periodicals, while the big American medical information services, MEDLARS and Excerpta Medica, refer to almost four thousand current titles. The biological information service BIOSIS (Bio Science Information System) refers to nine thousand current periodicals, of which about one thousand medical titles are not available in libraries of the Federal Republic of Germany (20). A survey of the quality of local medical literature supply for online information services in Ulm, where a big medical school is located, shows that local libraries provide a much smaller part of the literature requested as a result of online searches, compared with other requests (34).

The traditional German document delivery system is organized on a local, regional, and national level. In 1982, the collections of the libraries connected with the interlibrary loan service amounted to more than 100 million volumes. According to national interlibrary loan rules (24), orders must first be searched in local libraries. If this is not productive, the order is sent to one of the seven regional union catalogs and it has to find a location within that region. Only if this, too, is not productive is the interlibrary loan request sent from one regional union catalog to another in a prescribed sequence (no more than three union catalogs). Naturally, this system is not very effective and is very slow. To overcome some of the obstacles within the system, two other facilities have been added.

To accelerate interlibrary loan deliveries, at least for journal articles, a national serial database with holdings of about eight hundred libraries has been established. If a serial title is found in this database by the ordering library, it is known immediately if the journal is available on the local, regional, or only on the national level. In any event, the library can order the article directly from a library without going first to a union catalogue (23). Currently, this data-

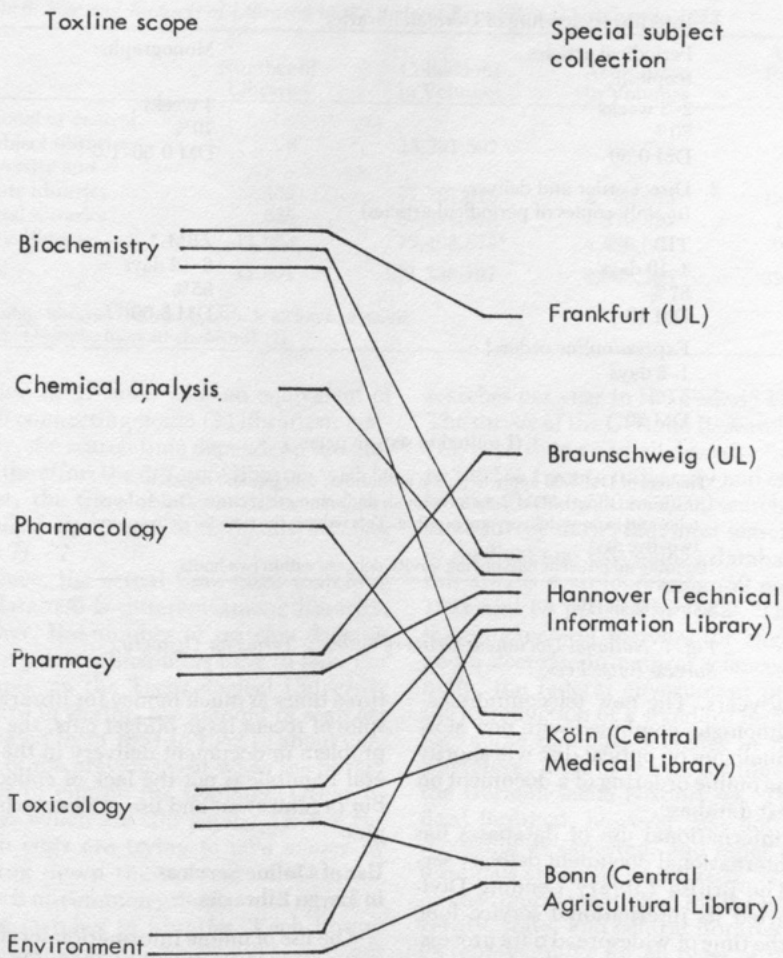
base registers almost 400 thousand serial titles with more than one million holdings. It is also a national serial cataloging network for about fifty libraries.

The second way to expedite interlibrary loan service is by a direct order on a national level to four central subject libraries and seventeen special subject libraries. The four central subject libraries are TIB Hannover (technical literature); Zentralbibliothek für Medizin, Köln (medicine); Bibliothek für Landbauwissenschaft, Bonn (agriculture); and the IWW, Kiel (economics). This subject-oriented decentralised lending system is based on a national acquisition program. Between 80 percent and 90 percent of the subsidiary literature needed for science and research is covered by the program (the figures are taken from the latest survey by Lehmann, 21).

In 1983, the German Research Society (the main organization which supports research projects in the Federal Republic and which is mainly financed by the government) financed the acquisition program for specific foreign literature within the special collection subjects with about eight million DM. Together, the special subject libraries hold 80,000 current periodicals and acquire over 100,000 monographs each year. The largest share of current periodicals (60 percent) is, of course, held by the four central subject libraries. Of the monographs acquired, 77 percent are located in seven of the larger special collection libraries. How the special subject library system works if an online database is used is shown in figure 6 with the example of the toxline database.

Currently the number of libraries participating in the German interlending system is more than 500. Together, they dealt with 2,932,356 requests in 1982. Fifty percent of all requests submitted were covered by the union catalogs, while the remaining 50 percent were requests for direct interlending. The number of requests satisfied in 1982 was 2,038,077, approximately 70 percent of requests made. The number of requests satisfied with photocopies was 1,146,048.

Throughout the system, articles are delivered as a photocopy, monographs as printed volume. Naturally, monographs take more time to be delivered than do articles. Figure 7 shows the time lag between



Source: Kraft (19).

Fig. 6. Scope of the Toxline Database and Corresponding Special Collections.

order and delivery of documents within the German interlibrary loan systems.

Fortunately, in 1983 a new project financed by the federal government was begun. It is aimed at establishing an online ordering system for online information systems in the Federal Republic. This online ordering system will be available at all hosts financed or supported by public funds. It will connect the online systems to transmit the orders directly to the libraries after a search in a database. The user will

have the choice between different document delivery systems in different speed and quality. As shown in figure 7, the traditional interlibrary loan system is the cheapest. It costs only 0.50–1.0 DM per loan. The faster systems of online ordering and online document transmission by telecopying will naturally be much more expensive.

The fastest systems deliver within about one or two hours. We will discuss later the new technologies for document transmission to be implemented in the Federal Republic, as in some other countries, in the

1. Interlibrary lending of German libraries	
Periodical articles (copies):	Monographs:
2-3 weeks	4 weeks
70%	70%
DM 0.50	DM 0.50-1.0
2. Direct order and delivery (mainly copies of periodical articles)	
TIB:	ZBM:*
4-10 days	6-12 days
87%	85%
DM 10	DM 5.50/7
Express/online order: †	
1-2 days	
87%	
DM 20	

(Limited to sixteen pages.)

*The fees of DM 5.50 apply to public authorities, colleges, and research institutes; those of DM 7. to individuals and commercial firms. Orders by telex and express delivery are possible. This reduces the time for delivery to two-five days.

†By using an efficient telecopying service delivery within two hours.

Source: Kraft (19).

Fig. 7. National Document Delivery Systems: Terms for Delivery, Success Rate, Fees.

next few years. The new telecommunication technologies combined with new storage technologies on optical disc will shortly allow the online ordering of a document on a full-text database.

The international use of databases has led to international document delivery services. The British Library Lending Division started its international service long before the time of widespread data processing. The German Technical Information Library (TIB, or Technische Informationsbibliothek) participates in the online ordering systems of Dialog, ESA/IRS, and two German online systems and offers its own international fast document delivery system. In 1982, it delivered 1,654 documents, of which 992 were from outside Germany. The traditional interlibrary loan traffic between European countries is very small.

Finally, table 6 shows figures about the size of collections and numbers of libraries in the Federal Republic.

The Federal Republic does not have the biggest libraries in Europe but it does have the biggest total collection and by far the biggest budget for libraries. Compared to France, the Federal Republic spends about

three times as much money for libraries. In spite of recent large budget cuts, the main problem in document delivery in the Federal Republic is not the lack of collections but organization and use of new technologies.

Use of Online Services in Large Libraries

The use of online information services in German libraries has been subsidized by the government and the German Research Society for several years and was, therefore, free of charge in a number of libraries until 1980-81.

There are no detailed statistics on the use of online services in all of the important libraries of the country. However, there are different statistical sources for parts of the libraries (13, 8), and for this article we have made a short survey of at least the major research libraries of the country and some major special libraries. The statistical data refer partly to 1982 and 1983.

Thirty-eight of the sixty-three large university, state, and central libraries use online information services. Altogether there were about 16,300 online searches (33 li-

Table 6. Size and Budgets of Libraries in the Federal Republic of Germany in 1982

	Number of Libraries	Collections in Volumes	Acquisition in Volumes	Acquisition Expenditure in DM
National or central subject libraries	6	13,291,597	493,788	26,188,726
University and state libraries	177	77,727,979	2,789,043	156,694,642
Special libraries	525	30,912,958	879,534	46,372,678
Public libraries	11,093	79,403,573*	4,486,000*	92,060,465
Total	11,801	201,336,107	8,648,365	324,316,511

*In public libraries the figures include all kinds of media.
Source: Deutsche Bibliotheksstatistik (7).

braries) in 21 hosts with an equivalent of 6,900 connecting hours (33 libraries). Naturally, the search time depends on the subject, the effort the different libraries wish to invest, the time of preparation, and the technical equipment of terminals, etc. (see table 7).

Hence, the actual time spent searching the database is different among libraries. Further, the number of searches depends on the prices which users have to pay. For example, in the Technological University Library in Berlin, the amount of searches decreased from 1981 to 1982 to about one-third of the previous year when the library began to charge for searches. Other libraries which are still paying some of the search costs are trying to save money by keeping down the amount of searches. There is no common practice with regard to online searches in libraries. Each library has its own policy and most still experiment with how to handle costs and services for online searches.

There is no great overall increase of

searches per year in the Federal Republic. The survey of the German Research Society (13) even shows a small decrease from 1981 to 1982 in twenty university and college libraries (from 9,500 to 9,300 searches). The same survey shows that most searches refer to medical and psychology databases, and this area is even increasing (59 percent in 1981 and 68 percent in 1982). There is a large increase of searches for engineering and a decrease in natural sciences. Originally, the federal government promoted the introduction of a standard terminal set for online database searches in libraries. Therefore, most of the larger libraries use the German-made Nixdorf set. The standard terminal, however, has not been as successful as expected, and other types of terminals are being introduced.

The figures mentioned for the large university, state, and central libraries cannot be representative for all types of libraries. The use of online services in public libraries is much smaller and in special libraries probably much higher. The data available

Table 7. Use of Online Information Services by German Libraries

Libraries	Sample	Online Database Access	Searches	Connecting Hours	Terminals	Hosts Mainly Used
University, state, central library	63*	38	16,300 (33 libr.)‡	6,957 (33 libr.)‡	47 (36 libr.)‡	DIMDI, INKA DBI, FIZ Technik
Special libraries	21†	18	6,000 (15 libr.)‡	1,765 (11 libr.)‡	20 (18 libr.)	INKA, DIMDI DBI

*All large libraries of this type.

†Not representative sample of larger libraries.

‡The figures are not available for all libraries; therefore we add, after the figure, the number of libraries included.

Source: DBI survey (8); DFG survey (13); questionnaire, 1983-84, author's survey.

for special libraries cover twenty-one larger special libraries but are not statistically representative of the whole community of this type of libraries. Nevertheless, these figures may show some trends.

In our sample, about 90 percent of special libraries have access to online information services. The number of searches and the use of different hosts are related to the size of the specialized user group and the special subjects of the library. Given that the user potential of a special library is always smaller than the user potential of a major research library, the 6,450 searches for fifteen libraries for which these figures are available is considerable. Twenty-two hosts are used, with the two large German hosts INKA and DIMDI preferred, followed by the American host Dialog.

TELECOMMUNICATION TECHNOLOGY

Telecommunication technology in combination with computer technology is the basis for the present and future development of the information industry. To introduce new telecommunication technology to the broader public takes quite a long time.

It is now quite clear which telecommunication technology will be used in the next years and which capacities and capability this telecommunication technology will make available. The tendency is, in principle, the same in all countries, but the level of technical development and of the implementation of new technologies is different. The Western industrialized countries are very close in the development of technology as well as in implementation.

The main direction is that of integrating all kinds of telecommunication systems: telephone, video telephone, telex, teletex systems, telecopying, television, transmission for digital data, telecommunication for computer networks, etc. The main factor is data transmission by cable and/or satellites. In recent years, government PTT administrations as well as private telecommunication enterprises in different countries have begun to introduce new kinds of cables with broad transmission capacity for all purposes. The cable technique to be used in the near future is fibre optics cable.

Fibre optics cable has, on the one hand, a great data transmission capacity but is, on the other hand, very expensive. So, the PTT of the Federal Republic of Germany (Deutsche Bundespost) has already started a test project with ten local fibre optics networks (project BIGFON) with three hundred clients. Some of the clients are going to use the total capacity of an integrated telecommunication system. Also, a fibre optics cable will be laid between Hamburg and Hanover, connecting local fibre optics networks; afterwards it will be extended to Munich via Frankfurt, Stuttgart, and Nürnberg. Because of the high price of the project it has not yet been decided when the whole country will be supplied with this technique. It depends on the telecommunication market. The price for the whole country is estimated to be about one hundred billion DM. At present the German PTT is introducing nationwide new coaxial cables (for a total rate of about forty billion DM), mainly to be used for cable television (which is not yet available). The fibre optics cable has a minimum capacity of 140 megabits per second (140 million bits per second). By special techniques this capacity can be increased many times, but in the near future in the Federal Republic it is expected to reach a data transport capacity of only two megabits per second.

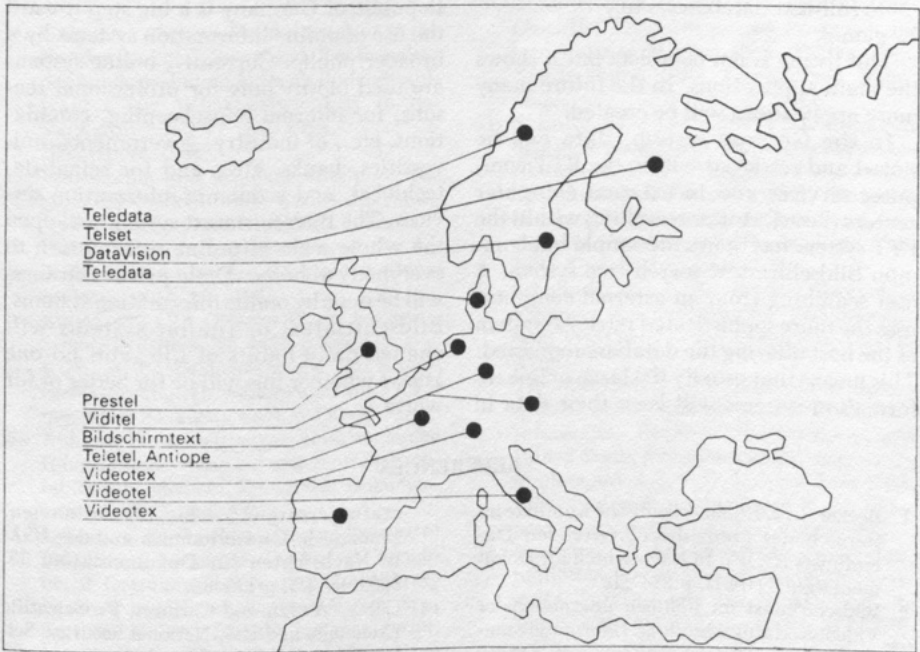
Even if integrated telecommunication systems are not yet fully operational, some advanced services using the capability of existing cable systems are already offered or in preparation. Also, the present system has a considerable data transport capacity. It has been mentioned that some European countries have introduced cheap national data communication networks which are already linked to some other countries. The Federal Republic of Germany introduced the Datex-P packet switching system for the transport of digital data in 1981 with speeds from three hundred to sixty-four thousand bits per second. This system has been extended in the meantime by other services such as teletex for text transmission, telefax as telecopying service, etc. The principal tendency of the German PTT for the transport of digital data is to support packet-switching systems rather than data transport by fixed lines and telephone.

The Datex-P system is one of the technical telecommunication facilities needed to introduce the interactive videotex system. It began as Bildschirmtext (BTX) in the Federal Republic of Germany in September 1983 after some local tests. Bildschirmtext is expected to become the main transport system for the use of online information by a wider public. The system—at that time called View Data—was developed by the British Post Office, and the first presentations were made in London in 1975. The first test (with forty industrial firms) started in 1976. In 1977, the German PTT bought View Data from the British Post Office and afterwards amended and developed the system for use in Germany (28). In later years other countries, including the United States, bought the system. After installing test systems in Düsseldorf and Berlin in September 1983, Bildschirmtext was introduced to the general public. At the same time, similar developments occurred in the United Kingdom and France. It has also been tested or introduced in more than forty other countries.

The interactive videotex systems of Europe are shown in figure 8 with their national names.

The principal purpose of the Bildschirmtext system is very simple. It allows anybody with a television set and a telephone to communicate interactively with any database and any person. The television is everyone's online terminal. It can transmit pictures, graphs, and text with a large character set. The output can be done on screen or on printout.

In the meantime, efforts have been made to coordinate interactive videotex systems in different countries to allow videotex telecommunication between participants in all countries. Agreements are in hand on character sets used, all kinds of coding, graphical presentation, control characters, protocols, etc. A worldwide standard accepted by all national systems is planned. The European countries have already agreed on a common videotex standard (the CEPT standard). In the meantime television equipment conforming to the CEPT standard is available, the first offered by a Ger-



Source: Bildschirmtext (2).

Fig. 8. Interactive Videotex Systems in Western Europe.

man firm. The principles of videotex systems are similar in all countries. The handling of the Bildschirmtext system is much simpler than the usual telecommunication systems and online services. It is not as sophisticated technically as most of the other systems, but it allows very wide use for customers and for organizations and services who offer their data. The system is relatively cheap, at least cheap enough to be used by an average household, not only to save money but for reasons of comfort, too. The main user functions are the following:

1. electronic mail, message transportation, telegrams, etc.;
2. industry advertising in private households and in many other places;
3. ordering systems on the basis of advertising, that is, ordering goods from the home television;
4. banking business, e.g., keeping bank accounts on the home television;
5. interactive educational programs;
6. use of online information services, online ordering of documents, and access to full-text databases, etc.;
7. games.

This listing is not complete but it shows the main applications. In the future many more applications will be created.

In the German system, data can be stored and retrieved within the PTT computer services and in external computer centers (hosts). A user searching within the PTT system has to use the simple but common Bildschirmtext search tree system. A user searching from an external computer uses the more sophisticated retrieval system of the host offering the database requested. This means that usually the large online information systems will keep their data in

their computer as host and make them accessible via BTX. Large firms, too, will store their data in their own computer centers, as will banks. Private communications and advertisement and ordering files for smaller firms will probably be stored only in the PTT computers. The PTT will keep the data and control the system on three levels. There will be smaller local and larger regional computer systems and one central computer system in Ulm. The central system will keep a copy of all data stored in the other Bildschirmtext computers except for the external computers, and it will control the whole system. This hierarchical computer system should ensure that the data traffic is dealt with locally as much as possible so that long distance lines are not used more than is necessary.

IBM has a contract with the German PTT to develop the software system for this concept. The project will become operational in June 1984. The hardware has already been installed.

The Bildschirmtext system in the Federal Republic of Germany is a big step toward the use of online information systems by a broader public. Currently, online systems are used mostly only for professional reasons, for internal housekeeping, calculations, etc., of industry, governments, universities, banks, etc.; and for scientific, technical, and economic information services. The Bildschirmtext system will open the whole scale of online information to everybody at home. Daily private business will be done by online information systems. Bildschirmtext or similar systems will change daily habits of life, and no one knows whether this will be for better or for worse.

REFERENCES

1. Becker, J.: Euro-amerikanische Konflikte im Bereich des grenzüberschreitenden Datenflusses (GDF). In *Nachrichten für Dokumentation* 6 (1981), p. 214-20.
2. Bildschirmtext im Rahmen internationaler Videotex-Harmonisierung. Information material of the Deutsche Bundespost. Darmstadt, 1982.
3. Busowietz, Manfred: Aspekte der Entwicklung im System der Informations- und Literaturversorgung in Skandinavien, Frankreich, Grossbritannien und den USA. In *Nachrichten für Dokumentation* 33, 1982, no. 4/5, p. 178-88.
4. Carey, W. D., and Carlucci, F.: Scientific Exchanges and U.S. National Security. *Science* 215/1982, no. 4529, p. 139-41.
5. Commission of the European Communities: Euronet Diane News. (a) No. 27 (Jul./Aug. 1982), (b) no. 30 (Feb./Mar. 1983), (c) no. 31

- (July 1983), and (d) no.33 (Dec. 1983).
6. Datenbanken: Das deutsche Defizit. In *Wirtschaftswoche*, no.39, V.37, Sept. 23, 1983.
 7. Deutsche Bibliotheksstatistik, 1982. Special computing. Deutsches Bibliotheksinstitut, Berlin, 1983.
 8. Deutsches Bibliotheksinstitut, IuD-Kommission: Informationsvermittlungsstellen in leihverkehrsrelevanten Bibliotheken der online-abfragbaren Zeitschriftendatenbank. Status: Sept. 1982.
 9. The European Database Market. Frost and Sullivan. New York, 1980.
 10. Euronet-Diane Launch Team: Verzeichnis der Datenbasen und Datenbanken. Sept. 1983.
 11. EUSIDIC Database Guide, 1983. Oxford, Learned Information, 1983.
 12. Fachinformation in der Bundesrepublik Deutschland. Stellungnahme der Bundesregierung zum Gutachten des Präsidenten des Bundesrechnungshofes als Bundesbeauftragter für Wirtschaftlichkeit in der Verwaltung. Bonn, 1983.
 13. Franke, S.: Auswertung der Jahresberichte 1982 der von der DFG geförderten Informationsvermittlungsstellen an deutschen Hochschulen. Essen, 1982. Unpublished manuscript.
 14. Gutachten über die Fachinformation in der Bundesrepublik Deutschland. Der Präsident des Bundesrechnungshofes als Bundesbeauftragter für Wirtschaftlichkeit in der Verwaltung (BWV). Apr. 1983.
 15. IDC report, 1982.
 16. Information and Database Publishing Report (IDP report). Ed. by Knowledge Industry Publication, New York, Feb. 1982.
 17. Das Inforum. Informations-Forum der Arbeitsgemeinschaft der Fachinformationszentren, no.12, Jan. 1982.
 18. Kolata, G.: CIA Director Warns Scientists, *Science* 215/1982, No.4531, p.383.
 19. Kraft, R.-P.: Dialogrecherche und Literaturversorgung. In *Nachrichten für Dokumentation* 34 (1983), no.3, p.130-35.
 20. Kühnen, F.: Auswirkungen eines modernen Informationssystems auf eine zentrale Fachbibliothek. *Medizin, Bibliothek, Dokumentation* 1 (1977), p.5-14.
 21. Lehmann, K.-D.: Structure and Practice of Interlibrary Lending in the Federal Republic of Germany. Seminar on Interlibrary Lending in Western Europe, Boston Spa, Sept. 26-28, 1983. Unpublished manuscript.
 22. Martin, J. K.: Computer-based Literature Searching. Impact of Interlibrary Loan Service. *Special Libraries* 69 (1978), p.1-6.
 23. Neubauer, K. W.: The National Serial Data System in the Federal Republic of Germany. In *Serials Review*, Jan./Mar. 1981, p.73-79.
 24. Die Ordnung des Leihverkehrs in der Bundesrepublik. Text und Kommentar der Leihverkehrsordnung von 1979 mit erläuternden Beiträgen. In *Zeitschrift für Bibliothekswesen und Bibliographie*, Sonderheft 35, 1982.
 25. Online Database Service Market Strategies, v.11, Western European Market Opportunities for Online Database Services, 1981. V.III, Executive Summary, Input Services for Management, 1981. Input study.
 26. Pergamon finally gets Infoline up and running, with CAS and PATSEARCH. IDP report, 16, 1981, p.4.
 27. Programm der Bundesregierung zur Förderung der Information und Dokumentation (IuD-Programm), 1974-1977. Ed. by Bundesministerium für Forschung und Technologie, Bonn, 1975.
 28. Rupp, E. P.: Bildschirmtext. Technik-Nutzung-Marktchancen. München, Wien: Oldenbourg, 1980.
 29. Schlitt, Gerhard: Elektronisches Publizieren von Volltexten. In *ABI-Technik* 3, 1983, no.2, p.125-29.
 30. Schmitt-Reindl, K. M.: Das Online-Geschäft. Perspektiven und Prognosen internationaler Marktstudien. Vortrag . . . Neu-Isenburg, 1982. Unpublished manuscript.
 31. Schulte-Hillen, J.: Die Verletzlichkeit deutscher staatlicher und wirtschaftlicher Aktivitäten durch Abhängigkeit von in- und ausländischen Datenbanken. Untersuchung, gefördert durch das Bundesministerium für Forschung und Technologie. Feb. 1983. Unpublished manuscript.
 32. Schulte-Hillen, J.: Ist die Bundesrepublik abhängig von ausländischer Fachinformation? Vortrag . . . 1983. Unpublished manuscript.
 33. The Specialized Information Marketplace and the Public Policies towards Specialized Information Services: The European and United States Situation (SISPI). Second interim report, v.1, V.II. London, June 1981. Submitted to the Commission of the European Communities DG XIII. Inspec study.
 34. Umstätter, W. and others: Die Universitätsbibliothek als Informationsvermittlungsstelle. Erfahrungen mit DIMDINET. In *Nachrichten für Dokumentation* 31 (1980), p.172-76. ■■

MARC IN MARC OUT

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When you can read in MARC tapes from any recognized source and write out MARC tapes from your own turnkey system, then your conversion dollars are soundly invested. You know that the records in your system database are part of a recognized standard. With all the flexibility of MARC and the local control provided by EMILS/3000, your database will grow increasingly valuable. And if you need to share your records with others, then EMILS/3000 is the logical choice.

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SEE US AT THE ALA IN DALLAS

RLIN Product Batch: Fundamental Design Concepts

Walt Crawford

Using a conservative, open-ended basic design, RLG was able to implement a wide range of output products quickly and with very little staff. The Product Batch system is easily extendable and is easy to maintain. Some of the fundamental design decisions are applicable to any library product output system.

RLIN, the Research Libraries Information Network, is primarily known as a large online bibliographic service. Like the other technical processing services, RLIN provides many output products, including transaction tapes, catalog cards, and acquisitions forms.

RLIN Product Batch was designed using a single consistent data definition, RMARC. This definition was combined with standard PL/I, modular programming techniques, and program documentation before coding to support rapid development of a stable system. The resulting system is composed of efficient, flexible, easily debugged and easily maintained programs. New services can be provided without endangering existing services.

Some aspects of RLIN Product Batch are specific to the situation of a network processing environment, where costs of production must be allocated among various users. Most aspects are relevant to any batch stream for a library system. This paper considers some of the fundamental decisions that shaped RLIN Product Batch and describes some of the results of those decisions.

DEFINITIONS AND BACKGROUND

The Research Libraries Group, Inc., (RLG) is a consortium of universities and

independent research institutions involved in a number of cooperative ventures. RLIN, the Research Libraries Information Network, is the set of computer hardware and software supporting the programs of RLG. RLIN has more than fifteen million records and more than 600 terminals installed.

RLIN II commonly refers to the Integrated Technical Processing System—the online component of RLIN providing acquisitions, cataloging, and search capabilities for the bibliographic files supported on RLIN.

RLIN has its roots in BALLOTS, the bibliographic system designed and implemented at Stanford University to serve its own library.^{1,2} BALLOTS included cataloging and acquisitions, but was specifically oriented to Stanford.

In 1978, the Research Libraries Group chose BALLOTS as the basis for its online system, and a staff was established on the Stanford campus, under a host institution agreement. The first major batch development for RLIN was WLDCARD, the network catalog card production system. This was developed by a team of programmer/analysts in the late 1970s. (See figure 1.)

The Product Batch Group was formed in 1980. After examining the BALLOTS output-product programs, we concluded that all product programs should be writ-

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FERAL CHILDREN--FICTION.

ART Vinge, Joan D.
 LIB Tarzan, king of the apes / Edgar
 PZ Rice Burroughs ; adapted by Joan D.
 7 Vinge. -- New York : Random House,
 V7457 cl1983.
 Tar 104 p. ; 20 cm.

Adaptation of: Tarzan of the apes.
 Summary: A baby boy, left alone in
 the African jungle after the deaths of
 his parents, Lord and Lady Greystoke,
 is adopted by an ape, whose own infant
 has died, and raised to manhood
 without ever seeing another human
 being.
 ISBN 0-394-86212-0 (pbk.) ; \$1.95

(Cont'd on next card)
 840129 CStRLIN
 840127 CStRLIN
 A* 84-B21
 83-42826/AC

ART AE 840129
 D000009 JMA/INT

A life for the stars.

ART Blish, James.
 LIB A life for the stars. New York,
 PS Avon Books, [1962]
 3503 143 p. 18 cm. (Avon ; G1280) (His
 L64 Cities in flight, 2)
 L5

I. Title.

STK 840129 840127 CStRLIN RPL
 B000001 WCC/INT D* 84-B15

Fig. 1. Example of WLDCARD Catalog Cards.

ten as new programs to suit the network environment of RLIN II.

CHOOSING LANGUAGES FOR RLIN

BALLOTS, including all of its output products, was implemented in PL/360, a programming language developed by Niklaus Wirth before he developed Pascal. PL/360 is a combination of assembly language and Algol syntax. While it provides some of the logical and programming power of modern high-level languages, it still requires programmers to take care of registers and other low-level details. It is not a widely used language and has no commercial support.

During 1980, the RLG Computer Systems Division decided to adopt one or more high-level languages for new development. The choice was difficult. An RLG language had to support structured programming

techniques, be well established with a strong future, be widely used in IBM-compatible environments, and supported by IBM or another established commercial vendor.

Further, the language had to be transportable, with compilers available for a range of machines, so that future RLG decisions about machine architecture would not be overly limited by the software investment. We needed a language with a large user community, so that we could hire experienced programmer/analysts, and we needed an efficient language with good string-handling capability.

Online development required a language that would work in Stanford's interactive program environment and with SPIRES, Stanford's database management system. Batch development required a language that could handle MARC-like records efficiently, one with good input-output capa-

bilities for flexible batch operations.

PL/I was an obvious choice for batch processing. It is the third most widely used language in American business and has proven effective for batch library processing over the last decade. It met all of RLG's criteria for batch use, but did not appear suitable for online use within the Stanford environment.

Of the twenty-odd languages considered, Pascal appeared to meet RLG's criteria most closely for online use. It is an elegant language, with features (such as strong typing) that help to protect novice programmers and are useful in a system developed by a programming team. The compiler is small and could be modified to work with Stanford's environment. Pascal lacks report-oriented facilities and sophisticated input/output: these would be serious disadvantages for batch processing, but were not important for online development.

The task force selected Pascal for online development and PL/I for batch, a decision that has served RLG well. RLG became a secondary test site for IBM's new optimizing Pascal compiler. This compiler included needed string extensions; others were added by RLG. The Integrated Technical Processing System is possibly one of the largest software projects carried out in IBM Pascal. Batch programming was (and is) done in standard IBM optimizing PL/I, with no local extensions.

SEPARATE PROGRAMS FOR SEPARATE PRODUCTS

In BALLOTS, a single, monolithic batch program analyzed each updated record and produced all needed products. Early analysis for RLIN Product Batch suggested that each output product should be handled separately, as a separate small job stream with logically separate programs.

Separate programs are smaller programming tasks, and debugging for one program can begin while the next program is being written. The monolithic program was difficult to maintain and to extend. Maintenance in a full network environment appeared to be quite difficult.

By 1980, it was clear that USMARC is, and will continue to be, a dynamic format, requiring periodic changes to accommodate new features. We saw the likelihood

that the needs and desires of RLIN users would change over the years, requiring new products and changes in old products. Some products would probably outlive their usefulness. Separate programs for each product allow maintenance on a given product, or creation of a new one, to proceed without fear of damaging existing products.

Separate programs can cause two problems. First, source records must be read once for each product. Second, separate programs can lead to a profusion of intermediate data formats and programming techniques, resulting in maintenance problems.

The first problem is minor in a batch environment dealing with sequential blocked records. RLIN currently processes twelve thousand to sixteen thousand new and updated records each day. The resulting file requires fewer than eight hundred reading operations by each program. This is a trivial number for each product.

The second problem was partially prevented by establishing a single record format to be used throughout batch processing. A single format supports a modular programming approach, building tools to handle the format. This approach yields an inherently consistent programming environment throughout Product Batch.

RMARC and RLIN MARC

RLIN MARC is a superset-compatible USMARC format.³ Most RLIN MARC records include extensive RLIN extensions to USMARC to accommodate local data, holdings, and acquisitions information. Any USMARC record can be considered to be an RLIN MARC record, and properly designed USMARC software will properly handle RLIN MARC records. As used internally, RLIN MARC is also modified in terms of character set and blocking technique, but in a fully reversible manner.

"Gateway" software in Product Batch can read any variety of USMARC record, including current LC format and current OCLC/RLIN tape format, and can write RLIN MARC records to tape in either of the two common tape formats.

The RMARC format is the common format for virtually all Product Batch processing. It is used as a command transaction

mechanism, as an accounting information transmission medium, as the storage medium for data retention and backup, and as a processing format for formation and sorting of output products.

The RMARC format constitutes a self-contained data dictionary, allowing individual programs to treat an RMARC file as a database. USMARC records carry their own data dictionary. RMARC records involve two levels of extension to USMARC: the RMARC prefix and RLIN MARC extensions.

An RMARC record consists of two parts, both optional:

1. A *variable-length prefix* which, if present, must be at least 3 characters long, and cannot be more than 2,048 characters long. The prefix begins with a binary halfword containing the length of the prefix (the only coded data allowed in an RMARC record) and ends with a field terminator (hex 1E).
2. An *RLIN MARC record*, as defined above. This record is stored in variable blocked format and in EBCDIC (extended for ALA characters), but is otherwise a pure USMARC superset.

There are three possible types of RMARC records:

1. *Prefix-only records*, consisting of a length halfword, record-type character, header, and label/element pairs. All RLG accounting and activity information is stored in prefix-only records. Product Batch programs transmit batch accounting information directly as RMARC prefix-only records, all with the record type *a* (for Accounting and Activity). Since the installation of RLIN II, accounting programs have used RMARC records as source data. The fifteen thousand to twenty thousand commands logged each day are also stored as prefix-only records.
2. *MARC-only records*, never encountered during daily processing, but processible without difficulty by all Product Batch programs. (Some programs would not produce anything from a file of pure MARC or RLIN MARC records because needed control elements would not be present. Still, the programs would recognize the records. Other programs, in-

cluding the utility print program RMPRINT and the generalized listing system RLIN Reports System,⁴ would accept MARC-only records and process them properly.)

3. *Mixed records*, containing prefix and RLIN MARC portions. Most daily processing involves such records, typically with two record types: *p*, product-only records, and *u*, updated records. Type *p* records include worksheet and technical-processing-form requests and error reports. Type *p* records are those that do not involve entry of a record (new or maintained) into the database. Type *u* records, those that do involve entry of a record into the database, are the source of most products.

Alphabetic record types tell processing programs what to look for in the first few characters of the prefix. The record type may also be blank. In this case, the prefix has no external definition.

A prefix with a blank record type usually contains a sorting string, stored in the prefix because MARC records cannot be sorted directly. Selection and sorting programs create such sorting strings, leaving the RLIN MARC record intact following the prefix. Because the RLIN MARC record is passed without change, decisions on printing format affect only the printing step, not the selection and sorting step.

While RMARC is the primary batch-processing format, SPIRES cannot provide RMARC records directly. The SPIRES batch format is self-defining but inefficient for sequential processing; records are transformed to RMARC as they enter the batch stream.

CONSEQUENCES OF THE CHOICE OF RMARC

The decision to use RMARC as the single batch format affected other decisions on program design. BALLOTS product generators created a print image from the record. The print image was then sorted and printed. This method appears to be efficient in terms of computer and disk resources, though it results in large, complex product-generation routines.

The apparent efficiencies of direct print-image creation are mostly illusory. If a full

SHOW THIS NUMBER (ON ALL INVOICES & LETTERS)		QUANTITY 1
PURCHASE ORDER 84-B14-1	DATE 01/25/84	PRICE 3.95
Blish, James, 1921- Earthman, come home. [New York, Avon Books, 1958, c1955]. (An Avon book) (His Cities in flight, 3) LCCN 55-5662. This is a tax-free institution.		
SHIP MATERIAL AND BILL TO: Acquisitions Department Research Libraries Group Library Jordan Quadrangle Stanford, CA 94305		
MOES <small>SUPN</small>	CRLG FUND <small>FUND</small>	JMA B1 <small>SIO STOC</small>
LIBRARY USE		(See Other Side) FORM NO. RLG-50 4 81

Fig. 2. Supplier Order.

print image is formed (allowing printing by use of a system utility), the image will probably be longer than an average MARC record. A 3-by-8-inch form with 22 printable lines, each 70 characters wide, requires 1,540 characters in addition to the sort key and carriage controls. The average RMARC record is between 1,000 and 1,200 characters long. Our experience is that any computer gain from scanning each record only once is negligible. The difficulty of maintaining direct print-image generators more than eliminates any potential machine efficiencies.

Direct print-image generation would not serve a network product-generation system well. To take an example (see figure 2), an RLIN run to generate supplier orders includes:

1. Multiple *libraries*, each of which requires an address sheet (and, for some products, a separate output job);
2. Multiple *departments* within some libraries, each of which requires an address sheet;
3. Multiple *vendors* within some departments or libraries, each of which requires an address sheet for one envelope's worth of orders.

The program that analyzes records will most likely not be working with records in the desired order; it can either generate large numbers of unnecessary address sheets (as the earlier system did) or require that the listing program, which could otherwise

be a system utility, actually generate those address sheets.

RLIN Product Batch places a sort key in the RMARC prefix, then carries the entire MARC record through the sort. Since all print generation takes place on a properly sorted file, address sheets can be generated at the proper point.

The single format also simplifies debugging, making the development path much shorter and smoother. A single listing program, the same one used to list LC MARC or other MARC records, can be inserted at any stage of the process to show what records are there and what state they are in. Record dumps are tedious and difficult to use; the listing program, which produces a formatted list (prefix and directory at top, tag preceding field, each field on a new line), allows much more pleasant and speedy analysis of data.

Our experience has been that one key to debugging library programs is determining what the bugs actually are. The RMARC program and associated listing utility makes this step much faster and more reliable; this, perhaps more than any other aspect of Product Batch design, has given the group a good record for fast troubleshooting and trouble-free operations.

Adoption of a single format has been enormously valuable in the success of Product Batch. Using USMARC as that format, enhanced by RLIN extensions, has made Product Batch inherently durable. Product

Batch need not be aware of new fields and subfields unless we must add them to lists. The new elements will appear in the records as added, without any intervention. If, at a later date, there is need to use them, the data is already in place, ready for extraction and use.

Use of USMARC/RLIN MARC also means that Product Batch is in a good position to produce special programs for special needs within RLG. The tools are at hand for processing the data. This has proven useful in a number of special cases.

DOCUMENTS AND PROGRAMS

The RMARC format existed first as a design document. This document was refined into its final form before any code was written. Once we were sure that the format would work, the first RMARC utilities were designed and written.

The remainder of Product Batch development followed (and follows) a similar pattern. A programmer/analyst works as an analyst first, preparing an internal design within the framework of Product Batch. This internal design is checked for completeness. It must satisfy the external design requirements and must handle all legitimate and illegitimate cases. The design is also reviewed in terms of Product Batch tools and methods. Most new programs make heavy use of existing code modules.

After a design is complete, program coding can begin. The coding comes last, and is usually not the largest part of the process.

In the first phase of development, most of these functions were carried out by a single programmer/analyst, with some review by others in the division. The first few months of development were spent writing and stating apparent problems. Others within the division were able to suggest solutions to problems (or show that the problems didn't really exist).

By preparing an extended set of design documents prior to coding, we were able to determine the extent of commonality between programs. This allowed design of program modules that could serve common needs without overlaboration.

An example: Orders, claims, and cancellations all use the same size form, and all have similar requirements. The information included in each is quite similar, particularly the bibliographic information. The tops and bottoms of the forms differ. Orders use separate address sheets and can have two different addresses (shipping and billing) on each order. Claims and cancellations have a single address but place the vendor address directly on the form. Figure 2 is a supplier order. Figure 3 is a claim, and figure 4 is a cancellation notice.

After studying these, it seemed reasonable to use a single module to produce the body of each form and a single module to retrieve and analyze vendor records. The

CLAIM	FOR MATERIAL	FROM	Acquisitions Department
ORDER NUMBER	ORDER DATE	QUANTITY	Research Libraries Group Library
84-B15-1	01/25/84	3	Jordan Quadrangle
			Stanford, CA 94305

Blish, James.
A life for the stars. New York, Avon Books, [1962]. (Avon ; G1280)
(His Cities in flight, 2)
* * * PLEASE RUSH * * *
This is a tax-free institution.
Please give this your immediate attention.
Two copies received 1/25/84.
THIS CLAIM IS FOR ONE COPY.
FIRST CLAIM.

The Best of Two Worlds
2411 Telegraph Ave.
Berkeley, CA 94704

BEST
SUBNCRLG FUND
LI FUNDJMA B1
S10 SLOCLIBRARY
USE

(See Other Side)

FORM NO. RLG-CLA 481

Fig. 3. Claim.

CANCEL		FROM	
ORDER NUMBER	ORDER DATE	QUANTITY	Acquisitions Department
84-B16-1	01/25/84	1	Research Libraries Group Library
ISBN 0-380-41616-6			Jordan Quadrangle
Blish, James.			Stanford, CA 94305
Cities in flight / James Blish. New York : Avon, 1970.			
PLEASE ADJUST OUR ACCOUNT 17130.			
CANCEL ORDER FOR ONE COPY.			

Midwest Library Service
11443 St. Charles Rock Road
Bridgeton, MO 63044

DATE OF NOTICE
01/25/84

THIS IS A CANCELLATION

I FORM NO
RLG-CAN 4.81

Fig. 4. Cancellation Notice.

surrounding information (tops and bottoms of forms, address sheets) seemed quite different. This design analysis resulted in common modules for the body of a form, and for retrieval of coded information, but left form tops and bottoms to individual programs.

The module used for the body of orders, claims, and cancellations was used for all form-oriented products other than cards. Figure 5 shows a departmental report (in this case, for new serial titles), figure 6 shows a requester notice, and figure 7 shows a technical processing form. These three forms have different widths than orders, claims, and cancellations, requiring a simple change in the control statements.

Several months were spent writing and refining the detailed internal design for RLIN Product Batch. The discipline involved was not always easy (it is tempting to actually program rather than design), but the results justified the effort. Thanks to the detailed designs, we recognized common needs in advance, leading to modular routines to be reused in many programs.

Code modules are included in Product Batch programs using the PL/I %INCLUDE function. Separately compiled modules were considered. Such modules reduce the readability of compiled programs, as some of the key functions do not appear in the compilation. INCLUDED modules have the same maintenance advantages as compiled modules, though

more machine time is required when modules change. In either case, a change need only be made once; all programs using the module can simply be recompiled.

MODULAR PROGRAMMING AND STRUCTURED CODING

Modular programming and structured coding are similar but not identical concepts. RLIN Product Batch code modules are almost always PL/I procedures or groups of procedures. RLG standards for use of PL/I call for explicit flow of control in all normal situations. Procedures are entered by CALLS and exited by procedure termination or RETURNS, not by branches.

Those who used PL/I in the early 1970s learned that CALLS and PROCEDURES, while efficient in terms of code development and maintenance, were expensive in machine time. With improvements in language compilers and in the computers, the supposed machine inefficiency is no longer a sufficient reason to use GOTOs in any but the most unusual circumstances.

Early Product Batch development also used explicit data flow, with all passage of data between procedures handled by parameters. This proved to be troublesome for two reasons:

1. Modular programming for bibliographic processing results in deeply nested procedures, where a fairly large number of variables may need to be

01/25/84 PARTIALLY RECEIVED

Blish, James.
 A life for the stars. New York, Avon Books, [1962].
 Two copies received 1/25/84.

B1	CAT	01/25/84
B1	CAT	01/25/84
E1	CLA	01/25/84

FUND FUND	SUPN BEST
ORDERED 01/25/84	INT PRICE 3.95
UID 84-B15-1	[ACO]

FORM NO. RLG-DR 4/81

Fig. 5. Departmental Report.

01/25/84 PARTIALLY RECEIVED

Blish, James.
 A life for the stars. New York, Avon Books, [1962]. (Avon : G1280) (His Cities in flight, 2)

B1	REC	01/25/84
E1	REC	01/25/84
B1	CLA	01/25/84

TO:
 Gregory Whitfield
 CLASS
 1415 Koll Cir.
 San Jose, CA 95112

FUND FUND	ORDERED 01/25/84	INT
SUPN BEST		
UID 84-B15-1		

FORM NO. RLG-DR 4/81

Fig. 6. Requester Notice.

Blish, James.
 A life for the stars. New York, Avon Books, [1962].
 Two copies received 1/25/84.

B1	REC	01/25/84
B1	REC	01/25/84
B1	CLA	01/25/84

01/25/84
 FUND FUND
 SUPN BEST
 UID 84-B15-1

SID JMA 01/25/84 INT

CRLG
I

FORM NO. RLG-DR 4/81

Fig. 7. Technical Processing Form.

passed from the top level to the bottom. Since passed parameters must be declared, and thus listed, in each level, the resulting program listing includes a great many irrelevant declarations, making it more difficult to read and maintain:

2. PL/I resolves parameter addresses each time the parameter is actually used in a program statement (as does IBM Pascal). While this is more efficient for intermediate levels (if a parameter isn't used, it isn't resolved), it is extremely inefficient for parameters that are heavily used (as in the MARC record itself, or any of the elements in the directory handling routine).

The first problem became a critical one in Product Batch. PL/I, like most modern languages, provides excellent cross-references. Cross-references show data usage in a program, unless the usage is masked by repetitive declaration of passed parameters. While explicit parameters can theoretically minimize side effects, we concluded that clean cross-references provided a better tool for debugging and maintenance.

The efficiency factor, while not critical for Product Batch, is by no means trivial. A typical MARC-handling program was compiled twice, changing only the field and subfield finding procedures. The version that passed data explicitly took twice as long to execute as the version using global data.

Most Product Batch programs now avoid parameters, except where a function takes different arguments at different invocations. Local data is used within procedures, but any data that must be known to several procedures is global to the enclosing procedure and is not explicitly passed from procedure to procedure.

The Pascal development groups have come to much the same conclusions, for some of the same reasons. Explicit, well-controlled flow of control appears far more significant than explicit control of data change.

OTHER DESIGN ASPECTS

Three other aspects of the RLIN Product Batch design and implementation are significant enough to deserve mention.

Accountability

RLG is owned by more than two dozen institutions and provides services to more than a hundred other institutions. Each institution is billed for its work within the systems. RLG must be able to demonstrate that its bills are based on proper accounting methodology and on accurate counts of work done.

Product Batch is the conduit for all accounting and activity information and produces accounting records for all batch output. Provably accurate counting was an essential aspect of Product Batch design. Proper counting and accounting is essential to any system that charges for production; for a multi-institutional system, it is critical.

Online accounting is fairly straightforward. Each record entered carries with it an informational entry to tell us what was done, what special circumstances were involved, and, as a result, what should be charged. The fiscal system, now under the Product Batch umbrella, handles each transaction separately, summing to arrive at monthly figures.

Product Batch works differently. All products are accounted for at the time of listing (or, in the case of tapes, actual tape writing). A single accounting record is written for each institution, giving its counts for that run. Because the applications program is actually adding up individual operations, there is potential for error.

Product Batch design minimized this potential by documenting and clarifying what constituted a chargeable product and by using a single module for all production of accounting records.

Count balancing, discussed in the next section, plays a major part in Product Batch accountability. The RLIN accounting system was recently audited by an independent firm. The system was found to be correct.

Count Balancing

Count balancing involves record keeping from stage to stage of a multistage system, so that any given stage can be sure that nothing has gone wrong since the previous stage.

The initial record-conversion program produces a single record that says how many bibliographic records were converted. Each product-generation program reads that record; if the number of records it reads does not equal the number of records written by the first program, a failure is reported. Each product-generation program writes a similar record. The accompanying listing program must read the number of records written by the generation program, or a failure is reported.

The major use of count balancing is during testing. Counts can get out of balance due to problems at some stage. The count balances in the production system serve as a double check in case of hardware or software failure.

Reruns

Things go wrong. Forms can be misaligned in a printer, the ribbon can be too light, mail can be lost, or a package can be damaged in transit. Batch production systems require rerun capabilities.

RLIN Product Batch was designed with reruns in mind. Normally, a rerun is for a single library and for a single product. The RLIN product generators allow parameters that will cause a single library (or, in the case of larger failure, a range of libraries) to be used selectively for product generation. Since each product uses a separate generator, individual products are always rerun individually.

EXTENSIONS TO PRODUCT BATCH

RLIN Product Batch was designed to be extendable. Since each product uses a separate program, new products can be added without any worry about impact on existing products.

The power of the single RMARC format, and the power of PL/I, have led to several extensions already. Two past extensions to Product Batch, and one which is currently being developed, are worth mentioning.

The Command Analysis System

The RLIN II Integrated Technical Processing System includes a facility for logging commands. For each logged command, the text of the command, the time of

day, the time since the previous command, time taken to process the command, CPU time, and I/O count are all transmitted.

These command logs were always transmitted as prefix-only RMARC records. In the early days of RLIN II, programmer/analysts within the Integrated Systems Group analyzed the results using interactive tools. While useful, the tools were slow and limited.

The Product Batch Group was approached to see if the command logs could be analyzed as well or better by a more efficient batch system. Given the sheer power of PL/I, only a day or two of programming and documentation were required to develop a Command Analysis System, providing a range of reports giving far more useful data than the earlier analysis.

These reports have proven to be key guides to the health of the system. Further, they have enabled us to study both sides of the online system—not only how well we satisfy the users, but what the users are doing with the system.

Statistical programming in PL/I is far simpler than bibliographic programming. The Product Batch programmer/analyst was able to extend the Command Analysis System over time, to produce simple graphs showing system performance and to determine what sorts of statistics could actually be interpreted.

In late 1982, when cataloging and acquisitions were combined in ITPS, we began producing monthly charts showing daily response levels. These charts are sent to all RLIN users. RLIN response, generally very good, can be degraded on some occasions; the charts are produced without regard to the level of response. Current response charts show how many seconds are required each day to complete 90 percent of all commands (and, for those interested, 95 percent of all commands). Other charts show the percentage of commands completed within three seconds, by general command type. The latter charts are particularly significant in showing problems with RLIN operations. Figure 8 shows some of the charts.

The Command Analysis System is also providing feedback to users on searching problems. The recent *Information Tech-*

New Holdings: Adult

January 1985

Page 1

000-099: GENERALITIES

CALL#: 001.64 M147
The McGraw-Hill computer handbook. c1983.
Main

CALL#: 001.642 C738
Computerworld buyer's guide. 1983-
Main Ref.

CALL#: 016.813 T971
Twentieth century science fiction writers.
c1981.
Main Ref.

CALL#: 020.28 L244L
Lancaster, F. Wilfrid.
Libraries and librarians in an age of
electronics. 1982.
Main

CALL#: 025.3 O58
Online catalog : the inside story : a
planning & implementation guide. 1983.
Main

CALL#: 029.6 L7755
Literary agents of North America, 1983-84
marketplace : the complete guide to U.S.
and Canadian literary agencies. 1983.
Main Ref.

CALL#: 070.1 M445e
Matusow, Barbara.
The evening stars : the making of the
network news anchor. 1983.
Main
Mitchell Park

CALL#: 070.92 H636m
May, Antoinette.
Witness to war : a biography of
Marguerite Higgins. c1983.
Main
Downtown

CALL#: 098.1 T455b
Thomas, Cal.
Book burning. c1983.
Main
Downtown
Mitchell Park

100-199: PHILOSOPHY

CALL#: 128.3 S594r
Simon, Herbert Alexander,
Reason in human affairs. 1983.
Main

CALL#: 133.5 S158a
Sakolian, Frances.
The astrologer's handbook. [1973]
Main

CALL#: 133.92 T974t 1967
Twitchell, Paul,
The tiger's fang. c1967.
Main

CALL#: 136.1 F251s
Fast, Julius,
Sexual chemistry : what it is, how to
use it. c1983.
Main
College Terrace
Downtown
Mitchell Park

CALL#: 136.1 S617e
Singer, June.
Energies of love : sexuality re-visioned
1983.
Main
Mitchell Park

CALL#: 150.19 M467d
May, Rollo.
The discovery of being : writings in
existential psychology. c1983.
Main
Mitchell Park

CALL#: 157.3 H423f
Haynal, Andre.
Fanaticism : a historical and
psychoanalytical study. c1983.
Main

CALL#: 158.1 S628e
Skinner, B. F.
Enjoy old age : a program of
self-management. c1983.
Main
College Terrace
Downtown
Mitchell Park

CALL#: 172.4 K44h
Keyes, Ken.
The hundredth monkey. [1981]
Main
College Terrace
Downtown
Mitchell Park

200-299: RELIGION

CALL#: 229 B582jo
Bible. N.T. Apocryphal books. English.
Jones-Wake. 1979.
The lost books of the Bible : being all
the Gospels, Epistles, and other pieces
now extant attributed in the first four
centuries to Jesus Christ, His Apostles
and their companions, not included by its
compilers in the Authorized New Testament,
and, Syriac mss. of Pilate's letters to
Tiberius, etc. 1979.
Main

CALL#: 236 L752r
Lindsey, Hal.
The rapture : truth or consequences.
1983.
Main
Downtown
Mitchell Park

Fig. 9. Page from an RLIN Reports System List.

the complexities of bibliographic data and many of the complexities of holdings and acquisitions data. It is a simple design made for fast implementation and easy extension to meet new needs and changes in old needs.

USMARC, while not directly appropriate for online storage and retrieval, is very efficient and flexible for sequential batch processing. The major drawback of the MARC format, its lack of sortability, can be eliminated by addition of a simple, optional prefix. This combination is easy to process, easy to handle, and carries its own data dictionary.

Use of a single format in all stages of batch processing is enormously effective in terms of debugging and maintenance. Because we can insert a standard listing program at any stage of processing, we can spot flaws in a system rapidly and correct them rapidly.

Strict adherence to structured programming theory may not be practical, but modular coding and structured control flow do improve the readability and maintainability of a complex system. Product Batch uses global data without explicit parameters but has never required a GOTO.

Bibliographic data is sufficiently com-

plex of its own accord. A processing system should clarify where possible, rather than adding its own complexities. A system composed of many simple pieces can achieve complex effects but is still simple to modify and maintain.

Contemporary languages (including the fifteen-year-old PL/I) encourage programmer/analysts to make complex systems from simple pieces. The resulting systems carry a very slight overhead, but yield enormous benefits for the long run.

ACKNOWLEDGMENTS

The RLIN Product Batch Group was a one-person group during 1980, 1981, and part of 1982. However, the design and development of RLIN Product Batch was not solely due to the programmer/analyst. Many different members of the RLG central staff contributed ideas, review, feedback, and commentary during the design and development phase. In particular, Glee Harrah Cady, John Schroeder, and Carol Farlow Lerche all contributed crucial suggestions and ideas. Without their counsel and insight, RLIN Product Batch could not have been done as well or as quickly.

REFERENCES

1. *The BALLOTS Project, Final Report to the National Endowment for the Humanities; September 1972-31 January 1975.* (Stanford, Calif.: Stanford Univ., Stanford Center for Information Processing, Oct. 1975), (ED 121 333).
2. Project BALLOTS and the Stanford University Libraries, "Stanford University's BALLOTS System," *Journal of Library Automation* 8:31-50 (Mar. 1975).
3. Walt Crawford, "Library Standards for Data Structures and Element Identification: U.S. MARC in Theory and Practice," *Library Trends* 31:265-81 (Fall 1982).
4. _____, "The RLIN Reports System: A Tool for MARC Selection and Listing," *Information Technology and Libraries* 3:3-14 (Mar. 1984).
5. _____, "Long Searches, Slow Response: Recent Experience on RLIN," *Information Technology and Libraries* 2:176-82 (June 1983).
6. _____, "The RLIN Reports System." ■ ■

Special Section: ILS and LS/2000

Editor's Note: Last year, OCLC selected the Integrated Library System (ILS) to market to individual libraries under the name LS/2000 (the LS stands for Local System). ILS was developed at the Lister Hill Center for Biomedical Communication, a division of the National Library of Medicine. The ILS software runs on a variety of computers and is in the public domain. The system is being enhanced by OCLC and evaluated at several libraries. Upgraded versions of the ILS software were developed by two companies—Avatar Systems and Online Computer Systems. Avatar was acquired by OCLC in December 1983, and Online Computer Systems is engaged in joint development of LS/2000 with OCLC.

Versions of the following papers were delivered at the LITA/ISAS Online Catalog Discussion Group at the Midwinter Meeting of ALA in January 1984. The first provides a chronological overview of the development of ILS. The second paper concerns the use of ILS at the Pentagon Library, the first and oldest installation of ILS. The third paper describes OCLC's LS/2000. A fourth paper by Charles Goldstein on possible enhancements to the ILS public domain software was delivered at this session but was not available for publication.

The Integrated Library System: A Historical Overview

Richard S. Dick

INTRODUCTION

The purpose of this communication is to provide the reader with an overview of how the Integrated Library System (ILS) has evolved since its beginnings at the National

Library of Medicine (NLM) six years ago. This survey indicates who the individual players have been and describes their roles and contributions. The author has chosen to divide the historical aspects into five main periods. These include (1) events leading to the development of ILS; (2) the formative design stages of ILS at NLM and formation of Online Computer Systems of Germantown, Maryland; (3) the installation of ILS version 1.0 at the Pentagon Library; (4) the development of the ILS version 2.0 and formation of Avatar Systems of Potomac, Maryland; and, finally, (5) events leading to OCLC's recent acquisition of Avatar Systems and their arrangements for consulting services from Online Computer Systems.

EVENTS LEADING TO THE DEVELOPMENT OF ILS

The Lister Hill National Center for Biomedical Communications (known as LHNCBC or Lister Hill), which is the research arm of the National Library of Medicine, was experimenting with prototype circulation systems in 1977. These simple prototypes demonstrated some of the capabilities that Charles M. Goldstein (director of the Computer Technology Branch (CTB) at Lister Hill) and William H. Ford (a computer specialist in CTB) felt might be of interest to the library community. They wanted to explore the possibility of demonstrating what could be done with the then-current technologies for libraries. These demonstrations sparked the interest of Mary Shaffer, then director of the Army Library at the Pentagon (now known as the Pentagon Library). The Pentagon Library had received funds for the procurement of an automated library system. After surveying the marketplace, Mary Shaffer felt that the most desirable capabilities being sought were lacking in systems then available on the market. After discussing this dilemma with Goldstein, it was concluded that

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Lister Hill would embark upon a research-and-development project to demonstrate what could be done for libraries using current technology. The resulting system would be used at the Pentagon Library. Part of the research-and-development effort was to be underwritten by the Pentagon Library, but most of the funds the Pentagon Library initially provided were used to procure hardware. An interagency agreement between the General Services Administration (GSA), on behalf of the Pentagon Library, and Lister Hill was signed in late summer of 1977.

At this early stage in the development of ILS, the MIIS/MUMPS language was selected by Charles M. Goldstein and Bill Ford because it had significant advantages in textual manipulations and it did not require that users procure hardware from a single vendor. MIIS/MUMPS runs on Data General, IBM series 1, and Digital Equipment Corporation's PDP 11 series (not the VAX). The NLM could not be in a position of forcing users to purchase from a single hardware vendor. Standard MUMPS had not yet received ANSI approval, so this option was not initially considered.

THE FORMATIVE DESIGN STAGES OF ILS AT NLM

Lister Hill at this time had no individuals with a combination of library and automation expertise, but it had funding to contract for such expertise. William H. Ford served as the initial project director. Ford assigned various design tasks to agencies such as Boeing Computer Services, Mitre Corporation, and others. The design effort commenced in September 1977. At that time, the system was basically conceived as an "automated circulation system" with perhaps other modules to follow. It was late fall before the notion of an "integrated" library system had evolved. Many have thought that since the ILS emanated from NLM, it must have been tailored specifically for medical libraries. This assumption is incorrect, as shown by the general design criteria. These include

- modular integration of functions and files;
- operation on a range of hardware affordable even by small libraries;

- transportability/maintainability of programs;
- multilevel user interface;
- system network access.

In September 1977, the author joined the design team as a systems analyst with Boeing Computer Services. Boeing Computer Services was given the responsibility of writing the manuals that would show the screens for the circulation and the administrative subsystems. Under the leadership of Bill Ford and Chuck Goldstein, Lister Hill sponsored numerous task force meetings attended by people from Mitre, Boeing Computer Services, the Pentagon Library, and others knowledgeable in library automation. Mary Shaffer assigned Ruth Mullane the responsibility of coordinating the affairs of the Pentagon Library for the project and giving input during the design sessions. These meetings focused on formulating the basic principles around which the system would be designed. Such things as transaction log processing and the capability of moving freely between subsystems and between functions within various subsystems were significant contributions of Bill Ford and others on the task forces. The author spent much of September and October 1977 doing an in-depth literature search of systems and their capabilities as described in the literature. The master bibliographic file (MBF) was conceived on the premise that the system should be totally MARC-based and that it must be able to keep pace with MARC as it continues to evolve. By early February 1978, Boeing had completed the various screens indicating how the various circulation and administrative functions should work. The philosophy behind the approach was that if the screens could be shown first, or in other words, if a prototype user's manual was first written, then the coding would more naturally follow. During this same period, Mitre Corporation was working on specific conversion aspects and reports needed by the Pentagon Library. The Mitre Corporation provided Lister Hill with the services of Joan Lovelace, a librarian who contributed much to those early design sessions. In October 1978, the author left Boeing and joined Lister Hill.

By fall of 1978, NLM was gaining notori-

ety for having embarked upon the ILS project. Many people came to examine what was being designed at NLM. One of these was Allan Meyer, of the Enoch Pratt Free Library in Baltimore. Allan Meyer subsequently came to NLM on a "loan" basis. While at NLM, he worked principally on the design aspects of the HELP subsystem and of the report writer. In the fall of 1979, Allan Meyer left CTB to join Online Computer Systems. By fall 1978, the internal file structures had been formulated for the master bibliographic file, and other essential file structures were taking shape. By late December 1978, the Library Operations Division of NLM was pressing Lister Hill (specifically Goldstein) to deliver a Retrospective Data Entry System (RDES).

The NLM had made a commitment to complete a retrospective conversion of all of its holdings back to 1800. This conversion was to commence in the fall 1979, and it was intended that NLM provide the software and the computer system to support the conversion effort. Therefore, the author and others at CTB worked almost exclusively on the design of the RDES from late December 1978 until early summer 1979. This diversion slowed the development of ILS.

Some of this diversion was deemed justifiable by Lister Hill because it was expected that many of the things learned from RDES would be directly applicable to the ILS design. By summer 1979, some initial features of the ILS had been coded. For example, the system could support full MARC records and a tag-by-tag description of every field and subfield code, and its appropriate indicators by types of materials had been entered into the system. In addition, portions of the circulation and administrative subsystems were coded. Most of this programming had been done by an extremely competent programmer, Kristin Johnson, who was at that time an independent contract programmer working for NLM. Unfortunately during this period, largely due to time constraints, several elements that were specific to the Army Library, and thus not consistent with the philosophy of designing a general system, were included.

By June of 1979, Bill Ford and Kristin Johnson had formed Online Computer Systems, of Germantown, Maryland, under

the parent company of Old Dominion Systems.

THE INSTALLATION OF ILS VERSION 1.0 AT THE PENTAGON LIBRARY

Soon after the departure of Bill Ford, the author became the project director of the ILS within Lister Hill. At this point, NLM had exhausted all of its options to "contract out" software development. Therefore, an RFP was released for contract programming using the MIIS/MUMPS language. There were only a few bidders, and a double award was made to Bolt, Baranek and Newman, (BBN) of Massachusetts, and Online Computer Systems, of Germantown, Maryland, with Kristin Johnson as the main programmer. Commencing in the fall of 1979, such things as the design note for how an authority file should work and a series of discussions leading to the design of the online catalog, or rather the underlying indexing mechanisms for support of the online catalog, were being formulated. In November of 1979, the Pentagon Library installed its Data General Eclipse S/130 and associated subsystems.

NLM's senior management asked that a functioning system at the Pentagon Library be available by July 1980. Reluctantly, a commitment was made to have ILS version 1.0 operational and available for release in the public domain by that time. This was a staggering undertaking, given the status of the various elements of the system at that point. Much of the design for basic elements of the system had been completed, but the critically important, more detailed designs, were not complete. During the first quarter of 1980, Ruth Mullane, Kristin Johnson, and the author worked together very closely, spending extremely long hours to meet the interim deadlines we had set so that we might achieve our overall objective by July. In retrospect, this was an extremely grueling and demanding period, but one of profound significance in the developmental history of ILS. The author was still, at this time, the only individual working on ILS at Lister Hill. During the early spring of 1980, the author felt a desperate need to acquire additional staff support in order to make the system operational. We at CTB were able to locate two

key people, Roger Metcalf, a programmer with several years experience in the MUMPS language, and Elizabeth Payne, a librarian, then employed by Peat, Marwick, Mitchell, and Co. Payne was at that time consulting for a client, focusing in part on evaluating various library systems. By late April 1980, the Pentagon Library was using ILS for circulation. This was accomplished with less than 2 percent of the collection in machine-readable form and none of the collection bar coded. Online Computer Systems, by this time, had two additional programmers working with Kristin Johnson. By late spring, the basic file structure required to support the extensive and flexible access points in the online catalog was in place. The structure was designed to support full keyword access on any field, if desired. The actual screens seen by the end user were not completed until the winter of 1980.

By April of 1980, Cyril Feng, the director of the University of Maryland Health Sciences Library (HSL), had decided to send Gary Freiburger, his new systems person, to NLM for the purpose of augmenting the CTB staff in hopes that the system would evolve faster. Gary Freiburger worked extensively with Mitre Corporation's staff in writing the HELP text for each function in the system during May and June 1980. We knew that we must include in the first public domain release, not only the source code, but also HELP text instructing the user how to proceed through each function as well as technical documentation concerning the code itself. Roger Metcalf worked on the application software and then produced programs that facilitated technical documentation. By early June 1980, Lister Hill "froze" the system so that the appropriate technical documentation could be provided. The system continued in daily operational use at the Pentagon Library at this time, and by July 1980, the National Library of Medicine sent version 1.0 to NTIS for distribution at a cost (determined by Lister Hill's management) of \$2,000. There was much controversy about this price, and most wanted it substantially reduced, but it remained unchanged in spite of protests. Version 1.0 included a serials check-in module, which basically worked but did not have much flexibility.

It also included the capability of printing routing slips. Version 1.0 used only "intelligent" bar codes, which are very controversial. The Pentagon Library is an advocate of their use and recommends them. Though instrumental in developing them, the author believes the same benefits can be realized via software while using preprinted or nonintelligent bar codes.

THE DEVELOPMENT OF THE ILS VERSION 2.0

By early August, the author was appointed to a management position at NLM. The author was able to negotiate a consulting arrangement to the ILS project during the ensuing months. By August of 1980, NLM was able to hire Elizabeth Payne as a full-time temporary employee. By October 1980, CTB had the following staff: Elizabeth Payne as the new project director, Roger Metcalf as the lead programmer, and Gary Freiburger working on ILS. Gary was still "on loan" from HSL. Online Computer Systems' programmers (without Kristin Johnson after December of 1980) continued the development of the authority files, and the online catalog began to become a reality. Elizabeth Payne and Gary Freiburger were the principals who supervised these critical elements. Elizabeth Payne, as project director, not only brought these critical elements into operation, but completed many of the missing parts to make it a viable system.

EVENTS LEADING TO OCLC'S RECENT ANNOUNCEMENTS

By midsummer of 1981, Elizabeth Payne, Roger Metcalf, and the author had turned in resignations, with the intent of starting a company—Avatar Systems—for the purpose of supplying support for development and implementation of ILS. Just prior to our leaving NLM, the arrangements to release version 2.0 to NTIS were concluded by Elizabeth Payne. This version contained a working online catalog, the authority files with global update, and a more complete circulation module. Version 2.0 had many of the critical elements essential to an integrated system.

In some circles, the formation of Avatar was greeted with enthusiasm, because it

meant that there would be two sources for maintaining ILS (i.e., Avatar and Online Computer Systems), and competition usually means better prices and broader options to users. We at Avatar knew that the competition would be keen in this market and that ILS had tremendous potential. We were equally cognizant of its shortcomings. The internals of ILS were quite fragile and less than the robust system we demanded. Therefore, we immediately purchased version 2.0 and set about to dismantle the system, rewriting much of it and streamlining its internals. Much of our work focused on making the system more modular for greater maintainability. Furthermore, we aimed at providing more consistency and flexibility throughout the system. One of Avatar's major concerns with ILS was that of maintainability. We were certain that the ILS (the public domain version) internals were in such a state that it could not be maintained effectively nor economically. We at Avatar were also eager to expand the system's capabilities to support multiple locations or sites. In the fall of 1981, Roger Metcalf, Elizabeth Payne, and the author finalized the design for the multilibrary or multisite capability. We also tried to anticipate the effect of adding other modules such as serials control, acquisitions, and reports.

During 1982, Chuck Goldstein formed the ILS users group. Out of interested libraries from the users group and others with more general interest in ILS have come several individuals willing to spend from a few months to nearly a year at CTB. These individuals have come to CTB to learn more about the system with the hope that additional personnel might accelerate the development of new functions. However, NLM's management has affirmed that all work on ILS at CTB is to cease as of January 1, 1984.

In 1982, at the urging of some of OCLC's staff, the author wrote a proposal to OCLC indicating some possible ways in which Avatar might work in conjunction with OCLC. On January 5, 1983, the author spent the day at OCLC demonstrating the new capabilities that Avatar then offered. As a result, key individuals from OCLC's Local Library System (LLS) staff came to

Avatar to contrast the LLS design with the Avatar System. Apparently the design match between the two systems was satisfactory because interest in Avatar intensified significantly upon the completion of this comparison. Throughout the latter part of January 1983, the two parties negotiated the sale of Avatar to OCLC. Principally for financial reasons, though other issues were considered as well, Avatar and OCLC were not able to arrive at an agreement and discussions terminated by early February. At this point OCLC turned to Online Computer Systems, which at that time, had three programmers with expertise in the internals of the public domain version. OCLC requested their assistance with the implementation of LS/2000, which would be based upon the NLM's ILS. OCLC and Online began significant benchmarking studies that provided much needed information about "stress points" in the system. The results aided OCLC in focusing on the set of enhancements needed to make LS/2000 more responsive. By the fall of 1983, OCLC and Online had designed and programmed enhancements to LS/2000.

During the early summer of 1983, OCLC and Avatar reopened discussions concerning the acquisition of Avatar. During the intervening time between January and July, Avatar had made several more extensions to the system using its own resources. Once again, OCLC sent people to Avatar to reexamine Avatar's System. By late July 1983, Avatar signed a letter of intent to proceed with the negotiations of the sale of Avatar to OCLC. OCLC acquired Avatar Systems on December 2, 1983. The transition toward providing the library community with LS/2000 is presently under way. The resources committed to the project are considerable, given that OCLC has approximately fifty staff members dedicated to the LS/2000 effort. In addition, OCLC has staff in the OCLC Washington Office (formerly Avatar) as well as those at Online Computer Systems who are dedicated to system development. OCLC is committed to LS/2000 as indicated by the growing staffing level, a broadly based set of users, and the long-range planning that is now in progress. ■■

The ILS—The Pentagon Library's Experience

Ruth Mullane

The Integrated Library System (ILS) is a minicomputer-based automated library system that supports technical processing, retrieval, and bibliographic management activities utilizing a single master bibliographic file that is capable of supporting all library functions. Several components have been implemented successfully in the Pentagon Library including circulation management, the online catalog, bibliographic file/activity control and management, and serials check-in. A full serials subsystem is currently under development and is scheduled for testing this summer. A property management subsystem developed to control furniture, supply, and equipment inventories is in the test phase with final implementation planned for late spring. ILS is programmed in MIIS (Meditech Interpretive Information System) and supported by the MIIS Operating System. ILS software is in the public domain and distributed through the National Technical Information Service (NTIS).

BACKGROUND

Development of ILS commenced in 1977 as a project of the Lister Hill National Center for Biomedical Communication (LHNCBC), which is the research-and-development agency of the National Library of Medicine. The Pentagon Library's participation ensued as the result of an inter-agency agreement with LHNCBC, in which the library provided additional funding and agreed to serve as the test site for the operational system.

Among the design objectives that have been realized in the Pentagon Library are

- (1) the modular integration of functions/files, in which the single master bibliographic file is able to support multiple functions and processes;
- (2) minicomputer capability that sustains implementation of small systems but not to the exclusion of large-scale applications;
- (3) a cost-effective, highly efficient user cordial system with sufficient flexibility to accommodate the basic functional requirements of a wide variety of libraries, to offer unique and innovative features that exploit the opportunities presented by current technology for modernizing library operations, and to provide a fuller range of information services;
- (4) hardware flexibility that offers one basic software package that can be installed on a variety of computers without modification. To date, the ILS can operate on the Digital Equipment Corporation PDP 11 series, the Data General Eclipse series, and the IBM series 1. The Pentagon Library uses a Data General Eclipse S130 and is very satisfied with its performance. Additionally, a wide range of video display terminals and other peripherals have been used successfully in ILS libraries.

The Pentagon Library is responsible for library and information service to all military and civilian personnel in the Department of Defense who are assigned to the Pentagon and to the National Capital Region who do not have access to library service at their duty station.

This is a medium-sized library with approximately one hundred thousand volumes, twenty-five hundred journal subscriptions (including army staff agencies who receive materials directly), one million documents, and substantial microform holdings. Daily statistics normally reflect approximately nine hundred users, 350 external circulation transactions, 250 reference/research queries, 275 items processed, and 3,060 searches in the online catalog. These statistics do not reflect the internal use of documents, microforms, legal research materials, and journal literature. There are eight commercial and federal online reference database services and an in-house acquisitions system used to generate purchase orders for continuations and periodicals. Additionally, an automated bookkeeping and word processing system pro-

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grammed in MIIS and accessed from the library's minicomputer was installed in 1982. Neither the acquisitions system nor the bookkeeping/word processing system are part of ILS.

DESCRIPTION

ILS version 2.1, described in this presentation, refers exclusively to its application in this library. Versions 1.0 and 2.0 were also tested here. Other ILS sites may use version 2.1 or 2.2. The serials control subsystem will be tested using the most current release, which ultimately will be integrated with other standard and customized software into the Pentagon Library's operational password. Each library that has installed ILS has customized software that has been incorporated to address unique requirements. This has resulted in slight variations among the different installations, but also reflects the strength of the system since it offers this flexibility and does not restrict every user to a rigid, preordained uniformity. The role of the master file is significant as all bibliographic activity is generated from this central source. Each master bibliographic record contains all MARC data, an appended activity record with item-specific information, e.g., copy number, volume, issue, etc., to complete the bar code, the unique record identifier called the BID (base identification), which is system-generated, and any local tags that may include non-MARC data.

To facilitate the tracking and control of all materials, bibliographic and patron records are identified by machine-readable intelligent bar codes. Three lines of human-readable code are printed on each book label including title, call number, and copy number for monographs; title, call number, and any volume, issue part, supplement, and copy for cataloged serials; and title, date of issue, and copy number for journals. Most journals are available for circulation in this library. The patron bar codes contain the user's and library name. In both instances a human-readable line below the bar code translates its contents. Sequential temporary bar code labels are also generated in order to circulate materials that have not been converted to machine-readable form and/or have not yet been permanently bar coded. All bar

code labels are printed in-house.

To date, 69,170 permanent and 72,657 temporary labels have been created. Much of the success of ILS in this library is attributed to the application of the bar code technology here. Some of the advantages of the intelligent labels include (1) ability to easily identify and apply correct labels to items despite concurrent label generation from three to four video display terminals; (2) ease of replacement of worn labels; (3) capability to closely monitor the formulation of system item identifiers and correct bar code configuration to avoid database problems, identify operator error, and assure quality control. The use of intelligent bar codes requires some additional front end processing, but the favorable results have offset this inconvenience.

The Pentagon Library has successfully implemented five subsystems. Each subsystem contains a HELP function that provides online instruction and assistance in the operation of the system. Brief descriptions of each subsystem are included but for purposes of this presentation, emphasis is placed on the online catalog, which is found in the catalog access subsystem.

CATALOG ACCESS

The online catalog is the most visibly exciting component of ILS. It has been operational in the Pentagon Library for more than eighteen months. Over one-third of the cataloged collection has been converted (25,850 titles) and is available for online searching. The card catalog was frozen in May 1983 when a transitional backup system of printouts and microfiche became available. Ultimately a microcomputer backup system is anticipated. In addition to the search features normally associated with a traditional catalog, e.g., author, title, subject, the online catalog offers keyword access in which all indexed terms are retrieved from a single dictionary file. Other search categories could include corporate author, conference name, ISSN/ISBN, call number, or any other access points desired. In a keyword search the system responds with a display of the usage and number of hits, e.g., two titles, three subjects, etc. This library uses sixteen indexes, but many of them, e.g., OCLC number and LC card number, are seldom

used by the public. When the next version is installed, the selection of the search groups will be reviewed and modified based on the actual experience accrued during the first two years of operation.

The search groups' definition process, which takes place prior to the indexing of the database, offers a unique opportunity for the librarian to profile the online catalog in advance of implementation and tailor it to the specific needs of the user community. Search groups identify the tags and subfields to be indexed and determine how the indexes will be handled. Stop words and phrase lists can be defined for various

types of indexes. A search group named "title" would contain any or all MARC tags associated with titles. The library has the option to define which indexes are to be authority controlled.

Truncated searching permits the use of partial words. Boolean "and" searches may be performed on entries within an index and/or between indexes. Various limits to searches, e.g., by year, are also possible. The indexing of subject subdivisions, which was never possible in a manual environment, has added a valued dimension to the searching process. Note the sequence of screen displays in figures 1-3. The keyword

CHOOSE THE TYPE OF SEARCH YOU WISH TO PERFORM

- 1 - AUTHOR
- 2 - TITLE
- 3 - SUBJECT HEADING
- 4 - OTHER

OR

- 5 - KEY WORD

(ENTER NUMBER AND RETURN) CHOICE:

PUBLIC CATALOG KEYWORD SEARCH

ENTER A KEYWORD:

KEYWORD: LEBANON

REF	TITLES	KEYWORD
R1	45	LEBANON
R2	2	LEBEDEV
R3	1	LEBEDOFF
R4	2	LEBEN
R5	2	LEBENDE
R6	1	LEBLANC
R7	2	LEBOEUF
R8	1	LEBOW
R9	2	LEBRA
R10	1	LECCA

(MORE - PRESS RETURN)

(ENTER NUMBER AND RETURN) CHOICE: R

Fig. 1.

KEYWORD: LEBANON

```

REF      KEYWORD APPEARS IN
R1       15 TITLE
R2       1 SUBJECT HEADING
R3       11 SUBJECT SUBDIVISIONS
(END)

```

(ENTER NUMBER AND RETURN) CHOICE: R

SUBJECT SUBDIVISIONS: LEBANON

REF	TITLES	SUBJECT SUBDIVISIONS
R1	1	FINANCE - Lebanon
R2	1	ISRALI-ARAB BORDER CONFLICTS, 1949- - Lebanon
R3	1	UNITED STATES - Lebanon
R4	1	MONETARY POLICY - Lebanon
R5	1	ISRAEL - Lebanon
R6	1	MILITARY BASES - Lebanon
R7	1	TERRORISM - Lebanon
R8	1	SYRIA - Lebanon
R9	1	ISRAEL-ARAB BORDER CONFLICTS, 1949- - Lebanon
R10	1	WORLD WAR, 1939-1945 - Lebanon

(MORE - PRESS RETURN)

(ENTER NUMBER AND RETURN) CHOICE: R

Fig. 2.

search is LEBANON. The sequence of displays proceeds to a card image that represents a title that would not have been discovered by the patron if the subject subdivision had not been indexed. See figures 4 and 5 for samples of the online catalog menu screens.

The online catalog offers powerful indexing capabilities and excellent response time. The screen displays the record in traditional card format. Additionally, the number of copies and the status of each are included, and the full MARC record can be displayed if desired. See figure 6 for samples of screens.

The popularity of the online catalog has far exceeded all expectations. Staff and user

acceptance and enthusiasm count among the most gratifying results of the entire project. This success is attributed largely to (1) facility of use; (2) rapid response time; (3) logically designed, orderly screens; (4) use of the familiar card image; (5) inclusion of copy, location, and availability information; (6) the high quality of the public access video display terminals, which contain an integral thermal printer capable of generating screen printouts in response to the depression of a single function key. Users are able to generate unannotated bibliographies as well as copies of individual screens to use in searching the shelves. During the first four months of implementation, 120,000 searches were conducted, but this

SUBJECT SUBDIVISIONS: LEBANON

REF	TITLES	SUBJECT SUBDIVISIONS
R11 (END)	1	ESPIONAGE, ISRAELI - Lebanon

(ENTER NUMBER AND RETURN) CHOICE: R

DS126.6.K57G64

Golan, Aviezer.
 Shula, code name the Pearl / Aviezer Golan & Danny Pinkas.
 New York : Delacorte Press, c1980.
 345 p. ; 24 cm.

Kishak-Cohen, Shula.
 Spies - Israel - Biography.
 Espionage, Israeli - Lebanon.
 Israel - Biography.
 Pinkas, Danny.

CIRCULATION STATUS:

CPY#: 1 AVAILABLE

Press <RETURN> to display next item, or
 Enter /AU for author, /TI for title, /SU for subject, /KW for key word search.

CHOICE:

Fig. 3.

CATALOG ACCESS SUBSYSTEM
COMMAND:

[SUBSYSTEMS]			
AS ADMINISTRATIVE	BS BIBLIOGRAPHIC	CAS CATALOG ACCESS	
CS CIRCULATION	SCS SERIALS CONTROL		
[GENERAL FUNCTIONS]			
COM ILS COMMENTS	HE HELP	PT	
DE DETAIL	PB PRINT BARCODE	TD	TIME & DATE
EX EXPERIENCE	PF		
[CATALOG ACCESS SUBSYSTEM]			
ES ENTER SEARCH TYPE	SU SUBJECT SEARCH		
AU AUTHOR SEARCH	TI TITLE SEARCH		
KW KEY WORD SEARCH	OS OTHER SEARCHES		

ENTER INDEX CHARACTERS OF DESIRED FUNCTION, OR 'EXIT' TO LOG OFF

Fig. 4.

CHOOSE THE TYPE OF SEARCH YOU WISH TO PERFORM

- 1 - AUTHOR
- 2 - TITLE
- 3 - SUBJECT HEADING
- 4 - OTHER

OR

- 5 - KEY WORD

(ENTER NUMBER AND RETURN) CHOICE:

CHOOSE THE TYPE OF SEARCH YOU WISH TO PERFORM

- 1 - OCLC NUMBER
- 2 - LIB OF CONGRESS CARD NO.
- 3 - ISSN/ISBN
- 4 - CALL NUMBER
- 5 - TITLE KEY
- 6 - AUTHOR/TITLE KEY
- 7 - CORPORATE AUTHOR
- 8 - CONFERENCE NAME
- 9 - UNIFORM TITLE
- 10 - GEOGRAPHIC NAME
- (MORE - PRESS RETURN)

(ENTER NUMBER AND RETURN) CHOICE:

CHOOSE THE TYPE OF SEARCH YOU WISH TO PERFORM

- 11 - SERIES
- (END)

Fig. 5.

Z699.A1C5

Closing the catalog : proceedings of the 1978 and 1979 Library and Information Technology Association institutes / edited by D. Kaye Gapen and Bonnie Juergens.
 Phoenix, AZ : Dryx Press, 1980.
 xiv, 194 p. : 24 cm.

Library catalogs. - Automation - Congresses.
 Gapen, D. Kaye.
 Juergens, Bonnie.
 Library and Information Technology Association (U.S.)

CIRCULATION STATUS:

CPY#: 1 AVAILABLE
 CPY#: 2 AVAILABLE

Press <RETURN> to display next item, or
 Enter /AU for author, /TI for title, /SU for subject, /KW for key word search.

CHOICE:

MARC FORMAT OF RECORD:

```
008 ' ' a 800711 b s c 1980 d e az f j k
      m b p q 0 r 0 s 1 t 0 v 0 w x eng
      y z
010 ' ' a 80023976
020 ' ' a 0912700564 : c $18.50
040 ' ' a DLC c DLC d ARL
049 ' ' a ARLL
050 '0' a Z699.A1 b C5
245 '00' a Closing the catalog : b proceedings of the 1978 and 1979
      Library and Information Technology Association
      institutes / c edited by D. Kaye Gapen and Bonnie
      Juergens.
260 '0' a Phoenix, AZ : b Dryx Press, c 1980.
300 ' ' a xiv, 194 p. ; c 24 cm.
504 ' ' a Includes bibliographical references and index.
650 '0' a Library catalogs. x Automation x Congresses.
700 '10' a Gapen, D. Kaye.
700 '10' a Juergens, Bonnie.
710 '20' a Library and Information Technology Association (U.S.)
949 '0' a Z699 c .A1 j C5
XCL ' ' a 800711s1980 azu b 00100 eng
YYY ' ' a 00862 b n c a d m e 2 f 2 g 00241 h 8 i i
      j 4 k 5 m
ZZZ ' ' b 06555418 c 821228
```

Press <RETURN> to display next item, or
 Enter /AU for author, /TI for title, /SU for subject, /KW for key word search.

CHOICE:

Fig. 6.

total doubled to almost 256,000 in the succeeding three months, a figure that has remained relatively constant.

This dramatic increase even amazed the library staff, which had completely underestimated the successful impact the online catalog would have on clientele. Limited instruction on the use of the online catalog

has been provided. Most users have been able to successfully follow the brief instructions located at each terminal and proceed independently through the searching process. The reference staff provides briefings twice weekly to users who wish to enhance their search techniques and to understand more about the system. The keyword

search has been most popular, followed by subject heading and then title.

BIBLIOGRAPHIC SUBSYSTEM

The bibliographic subsystem controls the development and maintenance of the master bibliographic file. It provides the sound formation and fundamental reliability and dependability that make the ILS such an excellent product. The more one works with this subsystem, the more one appreciates the power and flexibility it gives to the total ILS. The major functions featured in bibliographic control include the file and index profile capability that allows the library staff to identify which MARC tags and subfields are to be included in the system, to create any local non-MARC tags that are normally given alpha or alphanumeric identifiers, and to develop the search groups for the online catalog.

This process is very complex and requires considerable planning and analysis. It is at this initial stage of ILS implementation that crucial decisions regarding the future intellectual arrangement, organization, accessibility, control, and functional operation of the entire library are determined. It is possible to reprofile and modify search group definitions after a period of experimentation, but to do so it is necessary to reindex the database during which time the complete online catalog is unavailable for use.

Other activities featured in the bibliographic subsystem include cataloging with full-edit capability and MARC tape loading. The OCLC interface, which has been operational since May 1982, allows records entered at the OCLC terminal to be simultaneously transmitted to the ILS master bibliographic file. One of the interesting by-products of this accomplishment is the availability of new items in the online catalog before the piece has been physically bar coded and processed for patron use. A message had to be added to the online catalog display in such instances to notify the user that the book has not yet been bar coded. Although it is technically available, it does not appear on the new-book shelf or in its proper place in the stack area so a staff member must retrieve it from the Catalog-

ing Department. This contrasts substantially with the old days, when catalog cards were frequently filed long after a new book was processed. The catalog review function supports the online review of all cataloging activity including the evaluation of new headings, the detection and comparison of possible duplication, and approval, edit, and delete functions. This provides the cataloging supervisor with a highly efficient vehicle for work evaluation and quality control.

The authority maintenance function supports any library-defined authority files in the MARC format. Additional features include the capability to review and edit headings and the tracing of *see* and *see also* references. Revision of headings results in the corresponding automatic revision of the headings in the respective affected bibliographic records. Authority control has been tested but is not yet operational in this library. Implementation is anticipated after completion of the serials control subsystem when the newest version is installed and the database reindexed. See figure 7 for a menu screen of the bibliographic subsystem.

The retrospective conversion of the portions of the collections that are not yet in the database occupies a high priority. There was no mass loading of records during the early stages of system start-up in the Pentagon Library. Rather, the archival tapes from OCLC were loaded into work spaces for individual editing and review before record-by-record transmittal into the database. This procedure was followed due to the original design philosophy that favored this approach. The gradual evolution of a database truly reflective of the library's actual holdings was preferred to mass loading, or the rapid conversion of an uninventoried shelflist. Most archival bibliographic records have been moved to the master file. It should be noted that this is the only library that has followed this practice, but it has produced satisfactory results. An online catalog is not as forgiving as the traditional card catalog, and with its display of copies, availability, and location, the mass loading of all holdings without regard for the actual verification of the availability of the piece was a compromise of credibility that was not considered worth risking. The retro-

BIBLIOGRAPHIC SUBSYSTEM
COMMAND:

SUBSYSTEMS					
AS	ADMINISTRATIVE	BS	BIBLIOGRAPHIC	CAS	CATALOG ACCESS
CS	CIRCULATION	SCS	SERIALS CONTROL		
GENERAL FUNCTIONS					
COM	ILS COMMENTS	HE	HELP	PT	
DE	DETAIL	PB	PRINT BARCODE	TD	TIME & DATE
EX	EXPERIENCE	PF			
BIBLIOGRAPHIC SUBSYSTEM					
BI	BIBLIOGRAPHIC ADD/ED	LI	LIST INDICATORS	ID	ITEM DELETE
TA	TAG ADD/EDIT	PO	PROCESS OCLC TAPE	DC	DICTIONARIES
OT	OUTPUT TAGS	DT	DISPLAY TAPE OUTPUT	CR	CATALOG REVIEW
FW	FIND WORDS IN TAGS	WA	WORKSPACE ADD/DELETE	AM	AUTHORITY FILE MAINT
PG	PRIORITY GROUPS	EW	EDIT WS RECORDS		
ST	SELECTION STRATEGIES	NE	NEWLY CATALOGED ITEM		
IA	INDICATORS ADD/EDIT	EI	EDIT ITEM		

ENTER INDEX CHARACTERS OF DESIRED FUNCTION, OR 'EXIT' TO LOG OFF

Fig. 7.

spective conversion project will be completed in-house without additional personnel. The negative impact, of course, is the continued reliance on the card catalog for older materials; but in this environment a diminishing inconvenience is considered preferable to an unverified database.

CIRCULATION

The circulation subsystem, the first element of ILS to become operational, was implemented in June 1980. In addition to the basic features generic to circulation control, such as charge out/in, renew, reserve, patron registration, and item status, ILS offers a cart function that allows the creation of defined temporary locations for bar coded materials (e.g., preliminary shelving, new book truck, etc.) in order to identify the location of items in the library that are not currently in place in the stack area and a shelf function that makes it possible to monitor internal usage in order to obtain more accurate circulation statistics. See figures 8 and 9 for examples of patron-status and item-status screens. There are different due dates for books and journals, and the system allows for overrides of any automatic due dates. Reserved materials are trapped upon their return and a message is displayed notifying the operator of the hold status.

In the event of system downtime, hand-held devices are to be used to continue minimum circulation services. The implemen-

tation of this feature is imminent. Additional uses for the hand-held devices are shelf inventory and a more efficient method to measure internal circulation. Without the portable device, books that have been used within the library must be physically brought to the circulation desk and scanned with a light pen to register their use and then returned to their proper shelf location.

It is interesting to note that despite the deficiency of permanently bar coded items in 1980 when the system became operational (only the patron records had been input), the use of the temporary bar code labels allowed activities to proceed apace. Many librarians who have experienced disappointments in automated circulation projects have attributed their dissatisfaction to their inability to complete all data conversion prior to implementation. Such was not the case with the ILS in this library. The use of temporary labels that could be generated and applied quickly supplanted the original plan for a gradual data conversion process, involving the keying in of circulation information while the patron was waiting. This caused delays and queues at the circulation desk. The adoption of temporary labels has provided the circulation staff with an opportunity to acquire experience without the requirement to perform any significant conversion process at the circulation desk, linked checked-out materials with the patron record thus

MISS RUTH A. MULLANE *CIVILIAN*

EXPIRATION DATE: 09/01/83

SERVICE: ARMY
ORGANIZATION: ARMY
PHONE: 74301GS LEVEL: 13
OFFICE SYMEO: ANRAL

ROOM #: 1A518

ADDRESS:

3 ITEMS CURRENTLY CHECKED OUT

ID	TITLE	AUTHOR	DUE DATE	RENEW
%65	World shipping at risk :	Hill-Norton, Peter,	02/01/84	
6PH	The Europeans /	Barzini, Luigi Giorgio,	02/16/84	1
J4	World radio TV handbook.		01/13/84	

ITEM FOR ROUTING LIST

TEMP Library journal.

COPY# 1

TOTAL ITEMS CHECKED OUT TO DATE: 437

** WARNINGS **
PATRON DELINQUENT

RETURN TO CONTINUE:

ITEM STATUS

(0\$ +Y- \$%) Soviet military strategy in Western Europe in the

ID: (0\$ +Y- \$%) CALL #: UA770 .533 ISBN #: 0891260781 (pbk.) :

VOLUME: 0 ISSUE: 0 PART: 0 SUPPL: 0 COPY#: 1
GENERAL/MONOGRAPH TYPE: MILITARY LOAN PERIOD: 2 WEEKTITLE : Soviet military strategy in Western Europe in the 1970s /
AUTHOR: Schwartzman, Stuart K.

CHECKED OUT IN THIS PERIOD: 3 INTERNAL USAGE: 0

STATUS.....AVAILABLE

STATUS OF THE OTHER COPIES YES/

INDEX	COPY	STATUS	LP	AVAILABLE
1	C1	G/M (MILITARY)	LP: 2 WEEK	AVAILABLE
2	C2	G/M (MILITARY)	LP: 2 WEEK	AVAILABLE

ENTER INDEX# OR 'C' and COPY#:

Fig. 8.

reducing the manual file maintenance, and reduced pressure to complete the conversion process quickly.

Materials with temporary bar codes retain the book cards, which results in a small manual file at the circulation desk. The parallel manual system remains in effect for these items, but the balance has shifted from the beginning when very little was bar coded, until now, when a majority of the circulating items have their permanent bar codes. Under the manual system it took forty-five seconds to charge an item out. With the ILS it takes three seconds. The significant savings in time has been used to cross-train the circulation staff in conver-

sion procedures and utilize their skills in performing other ILS-related functions. Not only has this been a cost-effective and sound managerial measure, it has expanded the skills and knowledge of the library technicians, increased their marketability, and added variety to their work. This has fostered good morale, augmented their importance to the project, stimulated their interest in learning new things, and overcome their fear of computers. The librarians and library technicians have made many valuable suggestions that have greatly improved the system.

Several statistical reports are generated that reflect circulation activity, an example

ITEM STATUS

(0 -J- \$\$) The nature of American politics /

ID: (0 -J- \$\$) CALL #: JK271 .N5 ISBN #: 0192191217 :

VOLUME: 0 ISSUE: 0 PART: 0 SUPPL: 0 COPY#: 1
GENERAL/MONOGRAPH TYPE: GENERAL LOAN PERIOD: 2 WEEKTITLE : The nature of American politics /
AUTHOR: Nicholas, Herbert George.

CHECKED OUT IN THIS PERIOD: 0 INTERNAL USAGE: 0

STATUS.....AVAILABLE

NO OTHER COPIES ON FILE

RETURN TO CONTINUE:

ITEM STATUS

(0\$.QB \$.) A few great captains :

ID: (0\$.QB \$.) CALL #: UG633 .C78 ISBN #: 0385133103 :

VOLUME: 0 ISSUE: 0 PART: 0 SUPPL: 0 COPY#: 1
GENERAL/MONOGRAPH TYPE: MILITARY LOAN PERIOD: 2 WEEKTITLE : A few great captains :
AUTHOR: Copp, Dewitt S.

CHECKED OUT IN THIS PERIOD: 9 INTERNAL USAGE: 0

STATUS.....AVAILABLE AT CART: PRELIMINARY SHELVING
LOCATION: CIRCULATION

INDEX	COPY	STATUS			
1	C1	G/M (MILITARY)	LP: 2 WEEK	AVAILABLE	
2	C2	G/M (MILITARY)	LP: 2 WEEK	AVAILABLE	
3	C3	G/M (MILITARY)	LP: 2 WEEK	AVAILABLE	
4	C4	G/M (MILITARY)	LP: 2 WEEK	AVAILABLE	
5	C5	G/M (MILITARY)	LP: 2 WEEK	CD - DUE 02/15/84	

ENTER INDEX# OR 'C' and COPY#:

ITEM STATUS

(0+ 78B \$\$) New Zealand and the Pacific /

ID: (0+ 78B \$\$) CALL #: DU421 .N423 1984 ISBN #: 0865319294 (pbk.) :

VOLUME: 0 ISSUE: 0 PART: 0 SUPPL: 0 COPY#: 1
GENERAL/MONOGRAPH TYPE: GENERAL LOAN PERIOD: 2 WEEKTITLE : New Zealand and the Pacific /
AUTHOR:

CHECKED OUT IN THIS PERIOD: 0 INTERNAL USAGE: 0

STATUS.....AVAILABLE AT CART: NEW BOOK STAND
LOCATION: CIRCULATION

NO OTHER COPIES ON FILE

Fig. 9.

of which is in figure 10. Included is a menu screen of the circulation subsystem functions.

SERIALS CHECK-IN

The serials check-in capability at present is limited to the check-in and bar coding of

journals for circulation control. The operator responds to a series of prompts regarding the loan period, type, date, volume, issue, part, and copy number. It is possible to route journals in the newer versions of ILS, but that function is not yet operational in this library. A major effort is in progress

CIRCULATION ACTIVITIES FOR JANUARY 1984						
	01/01	01/08	01/15	01/22	01/29	TOTAL
WEEK STARTING ON:	(4)	(5)	(5)	(5)	(2)	(21)
# ACTIVE DAYS:	(4)	(5)	(5)	(5)	(2)	(21)
CHECK-INS TOTAL	1307	1411	1313	1480	640	6151
MONOGRAPHS	758	806	634	880	346	3424
SERIALS	169	232	216	211	82	910
LAW ITEMS	34	50	38	36	27	185
TEMP. ITEMS	346	323	425	353	185	1632
CHECK-OUTS TOTAL	849	1098	1019	1151	622	4639
MONOGRAPHS	443	575	544	607	273	2442
SERIALS	151	163	158	171	87	730
LAW ITEMS	26	25	32	31	9	123
TEMP. ITEMS	229	335	285	342	153	1344
RENEWALS TOTAL	197	120	174	171	63	719
MONOGRAPHS	131	86	125	126	37	505
SERIALS	7	7	3	4	1	22
LAW ITEMS	10	1	3			14
TEMP. ITEMS	49	26	43	41	15	174
RESERVES PLACED	22	62	69	60	19	138
MONOGRAPHS	22	29	34	28	19	132
SERIALS		1	1	1		3
LAW ITEMS		2		1		3
TEMP. ITEMS						0

CIRCULATION ACTIVITIES FOR JANUARY 1984						
	01/01	01/08	01/15	01/22	01/29	TOTAL
WEEK STARTING ON:	(4)	(5)	(5)	(5)	(2)	(21)
# ACTIVE DAYS:	(4)	(5)	(5)	(5)	(2)	(21)
OVERDUE ITEMS RET'D	603	502	520	548	261	2432
MONOGRAPHS	338	289	279	298	144	1348
SERIALS	65	58	90	79	30	322
LAW ITEMS	15	17	12	14	12	70
TEMP. ITEMS	185	138	139	155	75	692
INTERNAL USAGE TOTAL	439	451	460	722	190	2262
MONOGRAPHS	156	183	186	214	68	807
SERIALS	123	125	123	252	65	688
LAW ITEMS	43	24	61	53	17	198
TEMP. ITEMS	117	119	90	208	40	574
OVERDUE NOTICES SENT	0	0	0	0	0	0
MONOGRAPHS	0	0	0	0	0	0
SERIALS	0	0	0	0	0	0
LAW ITEMS	0	0	0	0	0	0
TEMP. ITEMS	0	0	0	0	0	0
NON-RETURNABLE ITEMS	0	0	0	0	0	0

CIRCULATION SUBSYSTEM
COMMAND:

SCSYSTEMS

AS ADMINISTRATIVE	ES ENLIBROGRAPHIC	CAS CATALOG ACCESS
CS CIRCULATION	SCS SERIALS CONTROL	
<u>GENERAL FUNCTIONS</u>		
CM ILS COMMENTS	HE HELP	FI
DE DETAIL	PE PRINT BARCODE	TD TIME & DATE
EX EXPERIENCE	PF	
<u>CIRCULATION SUBSYSTEM</u>		
CA CART SYSTEM	NR NOTIFY RESERVE	RE RENEW
CI CHECK IN	PA PATRON ACTIVITY	RI RECEIPT CHECK IN
CD CHECK OUT	PD PATRON DELETE	RV RESERVE
CX EXPENDABLE ITEM	PP PRINT PULL SLIPS	SH SHELF
IL INTER LIBRARY LOAN	PR PATRON REGISTRATION	SS SET STATUS
IS ITEM STATUS	PS PATRON STATUS	VE VERIFY
ME MESSAGE	PU PULL	
MO MAIL OUT	RC RECALL	

Fig. 10.

now to complete the serials subsystem to include the additional features of automatic claims and binding control. This development will also provide a more flexible file structure, and more useful displays of serial holdings in the online catalog. See figure 11 for a menu screen of the present serials capability. Although the serials check-in system is not currently as sophisticated as the other ILS elements, it has stood the test of time very well in the Pentagon Library and

served as a very satisfactory interim method of handling serials in the online environment.

ADMINISTRATIVE SUBSYSTEM

This subsystem features several useful functions that make it possible to operate the system without in-house computer professionals. A variety of reports can be generated, a list of which is in figure 12. The

SERIALS CONTROL SUBSYSTEM
COMMAND:

```

[SUBSYSTEMS]
AS ADMINISTRATIVE      BS BIBLIOGRAPHIC      CAS CATALOG ACCESS
CS CIRCULATION        SCS SERIALS CONTROL
[GENERAL FUNCTIONS]
COM ILS COMMENTS      HE HELP              PT
DE DETAIL              PB PRINT BARCODE    TD TIME & DATE
EX EXPERIENCE         PF
[SERIALS CONTROL SUBSYSTEM]
AR ADD ROUTING        SE SERIALS CHECK IN
  
```

Fig. 11.

```

1 CAD CIRCULATION ACTIVITIES -- DAILY
2 CAG CIRCULATION ACTIVITIES -- GENERAL
3 CAM CIRCULATION ACTIVITIES -- MONTHLY
4 CAMS CIRCULATION ACTIVITIES -- MONTHLY SUMMARY
5 CAS CIRCULATION ACTIVITIES -- SEMIANNUAL
6 CAW CIRCULATION ACTIVITIES -- WEEKLY
7 CAWS CIRCULATION ACTIVITIES -- WEEKLY SUMMARY
8 DAD DATABASE ACTIVITIES -- DAILY
9 DAG DATABASE ACTIVITIES -- GENERAL
  
```

(THERE'S MORE)..

Fig. 12.

capability of defining authorized users, the creation of system and circulation parameters, the online maintenance of user manuals, and the backup and restore function that permits the full recovery of data in the event of a crash provide outstanding support in the daily operation of the system. See figure 13 for a menu display illustrating the functions available in this subsystem.

In this library, ILS is backed up disk to disk daily, weekly, and monthly. New disk packs are formatted, the processor powered up and down, and routine operating system utilities are performed by three librarians on the staff who are systems administrators.

CONCLUSION

The library community owes a considerable debt to LHCNBC for this major breakthrough in library automation. Full credit must be accorded the LHCNBC staff and project team for their total commitment and dedication throughout the life of the project.

The Pentagon Library as the test site has been in a unique position to play a significant contributing role in the development and success of the ILS. The value of a live environment with input provided by experienced librarians and library technicians has been very beneficial to the development of a fundamentally sound system with

ADMINISTRATIVE SUBSYSTEM
COMMAND:

```

[SUBSYSTEMS]
AS ADMINISTRATIVE      BS BIBLIOGRAPHIC      CAS CATALOG ACCESS
CS CIRCULATION        SCS SERIALS CONTROL
[GENERAL FUNCTIONS]
COM ILS COMMENTS      HE HELP              PT
DE DETAIL              PB PRINT BARCODE    TD TIME & DATE
EX EXPERIENCE         PF
[ADMINISTRATIVE SUBSYSTEM]
CP CIRCULATION PARAM. LM LOG ON MESSAGE    US USER ADD/EDIT
DD DOWN SYSTEM        PQ PATRON FILE DEF.  VR VIEW REPORTS
HM HELP MAINTENANCE   SA SYSTEM ACTIVITY  BR BACKUP & RESTORE
JI JOB INITIATION     SD SYSTEM DOCUMENT  OC OCLC INTERFACE PARAM
JQ JOB QUEUE          SP SYSTEM PARAMETERS
LB LOG BOOK PRINT     UD USER DELETE
  
```

ENTER INDEX CHARACTERS OF DESIRED FUNCTION, OR 'EXIT' TO LOG OFF

Fig. 13.

practical application in the real world of library service. It would be difficult to overstate the benefits produced in the Pentagon Library since the arrival of the ILS. The system has done all of the things it was supposed to do and much more. It has provided a very cost-effective and efficient means of reducing redundancy, increasing speed and accuracy in operations, and diminishing the time-consuming and labor-intensive manual procedures associated with traditional library service.

But beyond this substantial improvement in the mechanics of operations, it has also provided enormous motivation and stimulation to library staff members, who have experienced real satisfaction and gratification at the opportunity to participate in such an exciting enterprise.

The added dimension that the online catalog brings to library service has also fostered enthusiasm on the part of the library users whose patience and support have been rewarded with a product in which they too take pride. One of the most gratifying rewards associated with the project is the observation of eager searchers occupying all nine public access terminals, registering great pleasure at the results, and introducing colleagues to the wonders of this marvelous new tool.

The advantages of ILS are only beginning to be experienced at the Pentagon Library, and it is anticipated that its true value will not be fully realized until the completion of the data conversion project, the implementation of the full serials control subsystem, the development of additional backup and reporting features, and the exploitation of the bibliographic file management and authority control functions.

One of the original design objectives, which does not often appear in the official documentation, was the intention to make a meaningful contribution to the library community. This was always paramount to Charles M. Goldstein, chief of the Computer Technology Branch, LHNCBC, who is the father of ILS. His altruism and his innovative ideas for the application of automation to library services and functional operations are being fully realized in this setting. ■ ■

LS/2000—The Integrated Library System from OCLC

Susan Olson

LS/2000, OCLC's integrated library system, is a minicomputer-based system that provides bibliographic file maintenance, circulation control, online catalog searching, and other automated services. Serials control and acquisitions modules, as well as an interactive link to OCLC's central system in Dublin, Ohio, are planned.

LS/2000 is an enhanced version of the Integrated Library System (ILS) developed at the Lister Hill National Center for Biomedical Communications of the National Library of Medicine. OCLC selected ILS as the basis for LS/2000 because it is an integrated system, compatible with the MARC format, and provides flexible parameters that allow library staff to tailor the system to meet their individual library's needs.

The Online Catalog of LS/2000 illustrates the benefits of a library system that is integrated, MARC-compatible, and flexible. The last half of this paper will discuss these key design features, using examples from the LS/2000 Online Catalog to illustrate the points discussed.

But first, to provide brief information about the support LS/2000 provides to many library functions, I will describe the other subsystems.

SUBSYSTEMS OTHER THAN THE ONLINE CATALOG

LS/2000 has many features designed for cataloging and circulation staff. Library staff can enter and edit bibliographic and copy-specific cataloging and either transmit the information from OCLC's Online Union Catalog via a printer port interface or enter this information directly on LS/2000. The system provides quick cataloging using previously stored bibliographic records for additional copies or volumes. LS/2000 has full, interactive

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authority control for both transfer and direct entry. Each library defines its own authority files. New and edited records are automatically checked against these authority files. Catalog and authority review files allow supervisory personnel to review and approve the work of other staff. Both the bibliographic and authority files are compatible with the MARC format. The library can define local fields as it desires.

The Circulation Subsystem contains functions for check-in and check-out, recall, renew, and holds. There is also a Reserve Book Room function. Special functions allow staff to prepare mailing labels, change hold queue priorities, print pull slips, define registration work forms, and register patrons. Circulation functions utilize bar code scanners. Library staff define the loan, overdue, fine, review, and hold policies, as well as the calendar for days the library is closed. Library staff can track the location of materials by defining temporary locations or "carts." For example, materials can be checked-in to a cart. When the items are shelved, the operator wands a bar code for the cart, and the system clears the cart and changes the status of each item from "on cart" to "available." Items can be temporarily loaned, or "transferred," to another location for subsequent circulation. Messages can be added to both patron and item records. The "shelf" function allows staff to record statistics for in-house use of materials as the items are returned to their shelf.

Administrative and Technical subsystems allow library staff to enter policy and system information to support the Bibliographic, Circulation, and Retrieval subsystems and to design the reports and notices to be provided by the system.

THE ONLINE CATALOG

A detailed examination of the Online Catalog of LS/2000 will show the benefits of an integrated, MARC-compatible, flexible system to both library staff and library patrons. The broad range of parameters available with LS/2000 allows the library staff to define the bibliographic record, authority files, and indexes for their local online catalog.

1. The Online Catalog is integrated

with the Bibliographic and Circulation subsystems.

An integrated system with a central database for bibliographic and patron information prevents duplicate staff effort and provides current information to both library staff and patrons. Without an integrated system, the library must maintain separate files for cataloging, circulation, serials control, acquisitions, and other library functions. With an integrated system, information is entered once in a central file. Updated information is immediately available to all users of this central file. To the user of the Online Catalog, an integrated system provides full, current information. Traditionally, patrons had to consult the library's catalog to determine which items were in the collection. Having determined that the library owned the desired item, they then had to search for it (or have staff search) on the shelves. If the item was not on the shelf then, in some circumstances, the circulation files could be searched to determine availability. In an integrated system, the public catalog provides availability status as well as holdings information. To the user of the Online Catalog, integration also means that the information is current. For example, titles of new books, entered by library staff in the Bibliographic Subsystem, are immediately available in the public catalog. When an item is checked out through the Circulation Subsystem, the availability status in the public catalog is immediately updated. Figure 1 shows the LS/2000 Online Catalog display providing both bibliographic and availability information.

2. Bibliographic and authority records are compatible with the MARC format.

The MARC format is used as a standard for the exchange of bibliographic information in machine-readable form. LS/2000 is fully compatible with the MARC formats for bibliographic and authority records. LS/2000 supports all fields, subfields, indicators, and fixed field data defined in MARC. LS/2000 allows users to enter any diacritic or special character that is defined for use in MARC records. Because the MARC format is the bibliographic standard, libraries can share bibliographic information in a local network, interfacing



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PUBLIC CATALOG		Searching: MAIN
Dickens, Charles, 1812-1870. A tale of two cities / Charles Dickens ; [edited, abridged, and annotated by Joanna Jellinek]. 1st American ed. New York : D. McKay Co., 1951. 111 p., [8] leaves of plates : ill. : 25 cm.		
France - History - Revolution, 1789-1799 - Juvenile fiction. Jellinek, Joanna.		
LOCATION	CALL# / VOL / NO / COPY	STATUS
MAIN	P27 .D55	Available
(END)		
Press RETURN to continue or /ES to start a new search:		

Fig. 1. Display Providing Current Holdings and Availability Information.

with other libraries using the same standard, or contribute to a local or regional union catalog. The use of MARC tags also makes in-depth indexing and the attendant variety of searching options possible. For example, authors can be selected from all the appropriate MARC tags and consolidated into one great category, AUTHORS. More finite, and helpful, divisions into categories such as AUTHORS (BOOKS), CORPORATE NAME AS AUTHOR, or CORPORATE NAME AS SUBJECT are also possible. Figure 2 shows the LS/2000 full MARC display.

3. Flexible parameters allow the library staff to tailor the Online Catalog to meet the needs of their library's staff and patrons.

LS/2000 users need not enter complete, detailed cataloging information for bibliographic records. LS/2000 allows library staff to define their work forms for bibliographic data entry. These work forms can prompt for detailed or brief information—whichever the staff desires. MARC tag prompts can be replaced in the work forms by easily understood labels. Figure 3 lists some work forms a library may wish to define. Figure 4 shows the work form definition form.

Library staff can define local fields to supplement fields defined in MARC. Fields might be defined to describe ephemeral materials, such as vertical file items, or nonbibliographic items, such as audiovisual equipment. Figure 5 shows a work

FULL MARC RECORD:	
001	* * * ocm02669741 B11216
008	* * * 770516r1951 nyuaf j b 00011 eng
010	* * * 76013406 /AC
020	* * * 0679203745 : c \$7.95
040	* * * DLC c DLC d s.c. d.2 CRK
043	* * * #-fr---
049	* * * CR:X c 1
050	* 0 * P27.D55 b Tal3
082	* * * (Fic)
100	* '10' * Dickens, Charles, d 1812-1870. w cn
245	* '12' * A tale of two cities / c Charles Dickens ; [edited, abridged, and annotated by Joanna Jellinek].
250	* * * 1st American ed.
260	* 0 * New York : b D. McKay Co., c 1951.
300	* * * 111 p., [8] leaves of plates : b ill. : c 25 cm.
504	* * * Bibliography: p. 111.
520	* * * Relates the adventures of a young Englishman who gives his life during the French Revolution to save the husband of the woman he loves. Illustrated with drawings and maps depicting the period.
Enter ^ to exit, /Forward or /Backward:	

Fig. 2. Full MARC Display.

```

DICTIONARIES
DICTIONARY NAME: WORKFORM
WORKFORM:

DEFINED WORKFORMS:
1 MONOGRAPH (BRIEF)
2 MONOGRAPH (FULL)
3 MONOGRAPHIC SERIAL
4 PERIODICAL (BRIEF)
5 PERIODICAL SERIAL

(MORE)

```

Fig. 3. Defined Work Forms for Data Entry.

```

DICTIONARIES
DICTIONARY NAME: WORKFORM
WORKFORM: 2
NAME: MONOGRAPH (FULL)
ASSUME ITEM TYPE: MONOGRAPH
(E)DIT, (D)ELETE, OR (L)IST: LIST

NODE TAG SF #LINE NXT-ANY NXT-NONE REO'D EXCPT D/I
0 0 1 1 ZLdc ZLdc
001b 001 b 1 00bp 00bp
00Bc 00B c 1 00Ba 00Ba
00B# 00B # 1 00Bn 00Bn
00Bn 00B n 1 00Bc 00Bc

(MORE) Enter ^ to exit, /Forward or /Backward:

```

Fig. 4. Work Form Definition Form.

```

DICTIONARIES DCLC TAG ADD/EDIT/DELETE/LIST
DCLC TAG: 100 NAME: MAIN ENTRY - PERSONAL NAME
AUTH TAG: 100 AUTH SG: 1 # REPEATS: 1 LOCALLY USED: YES

MATERIAL TYPE
1 2 3 4 5 6 7 8 9 U
S N AV MAP NU MAN T U SG#S

SF NAME
1
2
a NAME Y Y Y Y Y Y Y 13,26, Y
b NUMBER OR NUMERATION Y Y Y Y Y Y Y
c TITLES AND OTHER WORD ASS Y Y Y Y Y Y Y
d DATE(S) Y Y Y Y Y Y Y
# RELATOR Y Y Y Y Y Y Y
f DATE OF WORK Y Y Y Y Y Y Y
k FORM SUBHEADING Y Y Y Y Y Y Y
l LANGUAGES Y Y Y Y Y Y Y

ENTER (RETURN), 'F', 'B' TO VIEW SUBFIELDSENER ^ TO EXIT LIST, OR (H)EADING TO
ENTER (A)DD, (E)DIT+SF C TO EDIT SUBFIELD, (D)ELETE+SF C TO DELETE SUBFIELD

```

Fig. 5. Work Form for Defining the MARC and Local Fields.

form for defining the MARC and local fields used by the library.

Library staff also define which records, fields, and subfields are to be retained in the database. Before loading an OCLC-MARC tape into the database, staff may use a work form similar to the work form in figure 5 to define which records, fields, and subfields are to be added from the tape to the local database. Records can be selected by format or by level of cataloging. For example, staff may choose to select serials and monographs but to exclude films or to select all AACR2 records but to exclude "K-level" records.

LS/2000 allows the library to define different user interfaces for different user groups. Through the "user add/edit" function, the library can determine how the system will "appear" to each user. First, each user is given an experience level. The system provides detailed prompts and menus to inexperienced users. When an experienced user signs on the system, the system bypasses these prompts and menus. Next, each user is authorized to perform certain functions; the system will not allow users to perform functions for which they are not authorized. In addition, the system will not display prompts and menus for functions the user is not authorized to perform. Finally, each user is given an "interface type." LS/2000 supports four interface types: novice patron, experienced patron, reference librarian, and cataloging librarian. The library defines which LS/2000 in-

dexes can be used by which "interface types." Through the use of the experience setting, the authorization controls, and the interface types, the library determines how LS/2000 appears to different LS/2000 users. Figure 6 shows the experience, authorization, and interface-type parameters in the "User Add/Edit" work form.

LS/2000 allows each library to define its own indexes. Library staff define not only which indexes are constructed but which fields and subfields are indexed. One library may choose basic author, title, and subject indexes. Another library may choose to index, for example, the publisher's number for music and the geographic area code as well as the author, title, and subject. One library may include names used as subjects in its author index; another library might exclude these references. Figure 7 shows some indexes one LS/2000 library has defined.

The library also defines which authority-controlled indexes are provided.

LS/2000 provides a keyword index. Each library determines which fields are included in this index. In addition, LS/2000 provides stop-word and phrase lists (individual words, such as *New York* may be linked together and indexed as a phrase). These lists may be modified by the library staff. Figure 8 shows a work form for defining indexes.

Thus, LS/2000 provides the flexibility for library staff to define an Online Catalog designed specifically to meet the needs of

```

USER ADD/EDIT
SYSTEM ID: SMO
NAME: OLSON,SUSAN/
PASSWORD: SUSAN
EXPERIENCED: YES
AUTHORIZATION LEVEL: SYS ADMIN
SUBSYSTEMS: ALL
GENERAL FUNCTIONS: ALL
ADMINISTRATIVE FUNCTIONS: ALL
CIRCULATION FUNCTIONS: ALL
BIBLIOGRAPHIC FUNCTIONS: ALL
SERIAL CONTROL FUNCTIONS: ALL
REPORTS: ALL
CATALOG ACCESS FUNCTIONS: ALL
INTERFACE TYPE #: 1
  
```

Fig. 6. "User Add/Edit" Work Form.

```

DICTIONARIES
DICTIONARY NAME: SEARCH GROUP
ENTER INDEX #:
** LIST **

INDEX #  SG#  NAME OF SEARCH GROUP
31      31      PUBLICATION DATE
32      18      PUBLISHER
33      23      REPORT DISTRIBUTION CATEGORY
34      16      REPORT NUMBER
35      6       SERIES CORPORATE NAME AUTHORITY
36      93     SUBJECT HEADING - CONFERENCE NAME
37      92     SUBJECT HEADING - CORPORATE NAME
38      91     SUBJECT HEADING - PERSONAL NAME
39      40     SUDDOCS NUMBER
40      7       TEST SG
41      12     TITLE KEY
42      5       TOPICAL SUBJECT
43      4       UNIFORM TITLE
44      21     USE LIMITATION
    
```

Fig. 7. Example of Defined Indexes.

```

DICTIONARIES
DICTIONARY NAME: SEARCH GROUP
SEARCH GROUP NAME: TITLE
AUTHORITY SEARCH GROUP: NO
INDEX KEYWORDS: YES
SUBFIELDS EXCLUDED FROM AUTHORITY: NONE
SEARCH GROUP#: 7
AUTHORITY CONTROLLED: NO
INDEX TERMS: YES
INDEX TOP LOCATION ONLY: NO
** LIST **

INTERFACE TYPES          SEARCH GROUP TYPES

SUBFIELD TAG CODE  STRIP INITIAL  STOPWORD LIST  PHRASE LIST  STRIP NON-  REPEAT#
                ARTICLE?  # DESCRIPTION  # DESCRIPTION  ALPHAS?    TERM KEY
-----
245  a             NO             1 COMMON WORDS  YES          NONE      ALL
     b             NO             1 COMMON WORDS  YES          1        ALL
     e             NO             1 COMMON WORDS  YES          NONE     ALL
     p             NO             1 COMMON WORDS  NO           1        ALL
246  a             YES            1 COMMON WORDS  YES          NONE     ALL
     b             NO             1 COMMON WORDS  YES          1        ALL
     p             NO             1 COMMON WORDS  NO           1        1
247  a             YES            1 COMMON WORDS  YES          NONE     ALL

Press RETURN to continue:
    
```

Fig. 8. Work Form for Defining Indexes.

```

PUBLIC CATALOGS
Searching: MAIN

ENTER A KEY WORD: cities
    
```

Fig. 9. Keyword Entry Display. The LS/2000 User Enters a Term to Be Searched.

```

PUBLIC CATALOG                                     Searching: MAIN

KEY WORD:  CITIES

REF  TITLES  KEYWORD
---  -
R1   20     CITIES
(END)

CHOICE: R1/
    
```

Fig. 10. Keyword Index Display. LS/2000 Displays the Entries in the Keyword Index Which Match the Term Entered. The Searcher Selects the Index Term.

```

PUBLIC CATALOG                                     Searching: MAIN

TERM:  CITIES

REF  TERM APPEARS IN
---  -
R1   15 SUBJECT HEADINGS
R2    5 TITLES
(END)

CHOICE: R1
    
```

Fig. 11. Index Selection Display. LS/2000 Informs the Searcher of the Indexes in Which the Term Appears. The Searcher Selects the Desired Index.

```

PUBLIC CATALOG                                     Searching: MAIN

TERM:  CITIES
FOUND: 15

REF  DATE  TITLES                                AUTHOR          CALL NUMBER
---  -
R 11 1952  Cities and the 21st century /                   Gappert, Gary  HT 108 U7 v.23
R 12 1952  Residential energy costs for sol                Weir, S. B.    DDE/CS--30013-B
R 13 1951  A tale of two cities /                          Dickens, Char  PZ7.D55 Ta13
R 14 1949  The potential for diversificatio                AEC-GE Study  HC 107.W2 A32h
R 15 1949  County and city data book.                     United States  HA209 .U47
(END)

CHOICE: R 13
    
```

Fig. 12. Brief Citation Display. The Searcher Selects an Entry from a List of Entries Matching the Selected Heading.

PUBLIC CATALOG		Searching: MAIN
Dickens, Charles, 1812-1870. A tale of two cities / Charles Dickens [edited, abridged, and annotated by Joanna Jellinek]. 1st American ed. New York : D. McKay Co., 1951. 111 p., [8] leaves of plates : ill. ; 25 cm. France - History - Revolution, 1789-1799 - Juvenile fiction. Jellinek, Joanna.		
LOCATION	CALL# / VOL / NO / COPY	STATUS
MAIN	PZ7 .D55	Available
(END)		
Press RETURN to continue or /ES to start a new search:		

Fig. 13. Card Image Display.

the patrons and staff of that library.

OCLC provides default settings with the system for all parameters. These defaults are set to reflect the policies of the majority of libraries. Each library may choose to accept or change these defaults. Librarians from OCLC's Local Systems Division work with a library's staff to define profiles and parameters to reflect the library's policies.

Libraries' implementation of these parameters enables LS/2000 to appear very different in different libraries and to different users. However, figures 9 through 13 show a "typical" keyword search on LS/2000. Figure 13 is identical to figure 1.

The preceding figures illustrate one search in one LS/2000 system. Users can

search the Online Catalog using a variety of search keys, including author, title, subject heading, keyword, call number, ISSN or ISBN, and OCLC number. Library staff can select additional access points at their option. Searching is menu-driven and allows truncation and use of the Boolean "and" operator. LS/2000 remembers the previous screens seen during a search and provides searching controls that can be used at any time to end a search, back up to the previous display, get brief instructions, obtain help, or move forward through a list. With LS/2000 libraries can structure a local catalog system that answers the individual library's needs. ■■

AN OPEN LETTER TO THE LIBRARY COMMUNITY

The essential characteristics of society in the information age are instant availability of news and access to the gargantuan amount of information.

The information age is here, but we have just begun to take advantage of the transformation, or even explore the opportunities available to us.

How does a library participate effectively in the information age? How does a library remain as one of the primary stakeholders of information?

We can't depend on "business as usual." In the absence of a national consensus for libraries, we have become overdependent upon past concepts of what a library is supposed to do, and the role a library is supposed to play in society.

The absence of a new role and a new vision for libraries leaves the community with no visible reasons why libraries should increase their budgets, be upgraded and remain the guardians of information.

Libraries can't accept a no-growth future—a future, where their importance fades away just as the typewriter has given way to the word processor.

We can't accept the weakening of the libraries' role in the community, the disintegration to second-rate information providers or the redistribution of information access to the wealthy or advantaged.

We must guarantee that every person has equal opportunity to access information, equal access to the retrieval of information, and equal access to the use of information.

The idea that the future holds less promise than the past for libraries is unacceptable.

The best insurance against that happening is community demand for the library to play a dominant role in the future. It requires that libraries illuminate the future by becoming more relevant and of greater service and importance to the community.

What do we need?

- New vision...expanded charter
- New ideals and ideas
- New technology (patron access)
- New approaches to meeting the community
- Imaginative leadership
- Dynamism
- Creativity

To identify with the role of libraries in the future, it is necessary to think about it, to visualize it, and to bring that visualization to fruition.

Data Phase is committed to help invest in, implement, and create demand for a new realization and relevancy of the libraries' capabilities and role in society. Data Phase is committed to enhancing the libraries' role in society making sure that there is equal information access, learning opportunities, and technological dissemination, to everyone in the community, not just the privileged few.

Democracy is based on information access for all, information liberty, and information transference. We intend to play whatever role we can to guarantee that the library community comes to the forefront and is on the leading edge of the information age.

We don't mean this to be the last word on the subject, or even the first word. It is our desire to initiate a dialogue. We would like to know whatever people would like to say.

We value your ideas and your partnership. We intend to use this space in the future to publish the responses we receive so that we can continue the dialogue. Please address your correspondence to Steve Weiss, Senior Vice-President, Data Phase Corporation, 9000 West 67th Street, Shawnee Mission, Kansas, 66202.

We look forward to hearing from you.



Communications

ODIN: A Multifunction, Multitype Library Microcomputer Network

Charles T. Townley

BACKGROUND

The Online Database Information Network (ODIN) is a multifunction microcomputer-based network with eight members representing academic, public, school, and special libraries in four counties near Harrisburg, Pennsylvania.* Initially funded through LSCA-III funds administered by the State Library of Pennsylvania, ODIN is managed by the Administrative Council, composed of representatives of the Dauphin County Library System, the Harrisburg Area Community College, and the Pennsylvania State University Capitol Campus.

ODIN was established in 1982 to broaden access to information in south central Pennsylvania through technology.¹ Three objectives were identified for the first year of the project: (1) develop and provide access to local databases; (2) expedite interlibrary loan requests through electronic mail; and (3) provide access to commercially available databases.

The Administrative Council developed a

*Participating ODIN libraries are Bosler Free Library; Cumberland Valley School District; Dauphin County Library System; Harrisburg Area Community College; Lebanon County Library System; Pennsylvania State University Capitol Campus; State Library of Pennsylvania; and West Shore Public Library.

Charles T. Townley is head librarian, Heindel Library, Pennsylvania State University, Capitol Campus, Middletown, Pennsylvania.

decentralized network design, with each member having dial access to each other and to other networks. Specific ODIN tasks requiring extensive data storage would be carried out by one of the Administrative Council members. Based on this design, a request for proposal was issued for five small and three large microcomputers. After careful consideration, a contract was signed with Radio Shack for TRS-80 Model 3 and Model 16 microcomputers, 1200 baud modems, and other peripheral equipment.

LOCAL DATABASES

By creating and providing access to local databases in the four-county service area, ODIN intends to share file building responsibilities and increase access to the valuable but often underutilized local information contained in the manual files of participating libraries.² With the assistance of a database review committee, the Administrative Council selected three local databases for development during the ODIN's first year: (1) a name index to U.S. Census microfilm; (2) a local history file; and (3) a speakers/program file.

To deal with the limited number of characters per row on the TRS-80 Model 3 equipment and other project concerns, copyrighted software, named Small DB, was developed for file creation, maintenance, and searching of local databases. The software is written in BASIC and will run on a TRS-80 Model 16 with a TRSDOS operating system and, using the BASIC interpreter, with the Xenix operating system. The software allows the user to create databases containing records with a maximum of fifteen data elements of various fixable lengths. The software is menu-driven and the main menu lists the six principal subprograms: (1) install a database; (2) run a database; (3) update a record; (4) display

databases; (5) search; and (6) exit to BASIC. Further information on the software is available from the director of the Dauphin County Library System.

The name index to the U.S. Census is designed to provide reel and page-number access for surnames in the 1790 to 1910 census microfilm covering the four-county service area. To date, a staff member of the State Library of Pennsylvania has entered data on eighteen hundred surnames. The file is maintained at the Harrisburg Area Community College McCormick Library on a TRS-80 Model 16 with a 12 megabyte hard disk and may be accessed by any ODIN library during specified service hours. Access is provided by surname and county or roll number, ward number, division number, street number, volume number, MCD code, ED code, or institution affiliation.

The local history database is a full-text database containing public information on individuals in the four-county service area beginning in 1792. Text is drawn from (1) local newspapers; (2) church records; (3) cemetery records; and (4) court records. Especially emphasized are obituaries, reunions, baptisms, marriages, and burials. To date, information on more than thirty-two hundred individuals has been entered. The file is being developed by State Library personnel and maintained at the Harrisburg Area Community College. The database may be accessed during specified hours. Access is provided by surname; given name and surname; or given, middle, and last name.

The speakers file is a menu-driven database designed to provide access to information about speakers in the four-county service area. The speakers file is mounted on the TRS-80 Model 16 at the Dauphin County Library System and may be accessed by any ODIN member during normal working hours. Access is provided to any one or two of the following data elements: (1) broad topic; (2) narrow topic; (3) comments; (4) agency; (5) speaker's name; (6) address; (7) city; (8) phone; (9) fee; (10) availability; (11) entry date; (12) entering library. Thus a user can ask for a broad topic and a city, a narrow topic by a college professor, or just a list of free speak-



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ers in Middletown. A simple thesaurus has been developed for assigning broad topics. As computer security is enhanced, it may become possible to permit agencies to directly enter their own data about speakers. The software developed for the speakers file can be rapidly adapted by changing data element labels to establish data files on additional topics as needed.

INTERLIBRARY LOAN

Library resources in south central Pennsylvania can best be characterized as dispersed. While more than three million volumes are held in the four-county ODIN service area, only one library has more than five hundred thousand volumes. Further, most public and school and some academic libraries in the area do not use the OCLC interlibrary loan system. As a result many interlibrary loans were being needlessly routed to state resource centers, and delivery time was undesirably long.

Menu-driven interlibrary loan software was developed and mounted on a TRS-80 Model 16 with a 12 megabyte hard disk at the Dauphin County Library System, the public library district center. Participating libraries check the interlibrary loan program on a rotation basis twice daily, placing requests in the morning and noting fills in the afternoon.³ Items located are delivered by district center courier service. Public library requests not available in ODIN libraries are entered on the OCLC Interlibrary Loan Subsystem by district center staff at the end of each day. By speeding up the mail electronically and by canvassing ODIN library holdings, delivery time within ten days has increased from 22 to 65 percent of interlibrary loan requests.

COMMERCIAL DATABASES

The third ODIN objective is to provide access to commercially available databases. On the basis of perceived member library needs, the Pennsylvania State University Capitol Campus negotiated contracts for access and training with DIALOG, the Source, and Compuserve. After some initial problems, effective communications software was purchased for each ODIN library. A common fee struc-

ture and service policy was developed and implemented.⁴

During the first year of the ODIN network, more than eighty searches were conducted by member libraries. While this is a commendable beginning, all members feel it falls far short of the potential need. To increase use, a public relations program, including a slide/tape presentation, handouts, and appearances at computer fairs and other community events, is being carried out by member libraries. In addition, a research project is under way to identify user perceptions of successful searching.

FUTURE DIRECTIONS

The Online Database Information Network has clearly broadened access to information through technology for libraries of all types in south central Pennsylvania. Technologically based, it can continue to grow and develop, although the initial funding cycle is complete. Local databases will continue to grow in size and scope. The Administrative Council has authorized the development of human resources, continuing education, tutorials, translation, and software expertise directories. An ODIN periodicals management system, based on CLASS Checkmate software, is in the planning and funding stage. Contracts for additional commercial databases have been signed by some ODIN libraries. Other technologies and projects are being considered for development. Information technology and multitype library cooperation are mutually supporting library development in south central Pennsylvania.

REFERENCES

1. Online Database Information Network, *ODIN Policy and Procedure Manual* (Harrisburg: Dauphin County Library System, 1983). Accepted for publication in ERIC.
2. Philip W. Williams and Gerry Goldsmith, "Information Retrieval on Mini- and Microcomputers," *Annual Review of Information Science and Technology* 15: 85-111 (1981).
3. Beth Givens, "Montana's Use of Microcomputers for Interlibrary Loan Communications," *Information Technology and Libraries* 1: 260-64 (Sept. 1982).
4. Tina Roose, "Online Bibliographic Searching in Cooperative Reference Networks," *RQ* 21:325-29 (Summer 1982). ■■

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The Clemons Library Reserve Circulation System: A Model for Distributed Processing in Library Networks

David T. Buxton

BACKGROUND

In 1977 the University of Virginia decided to automate the circulation process in Alderman Library, the university's main library. A batch system based on punched cards, written in Autocoder, and running in 1401 emulation on the university Administrative Computing Center (ADCOM) IBM 370-155 computer under OS/VS1, was clearly unable to handle the library's 500,000 annual circulation transactions without seriously burdening ADCOM's data-entry staff and machine resources. In fact, ADCOM was so eager to replace the batch circulation system that it offered to develop in-house an online circulation system at no cost to the library. This was an offer the library could hardly refuse.

The resulting online circulation system is based on the Total database management system and the Environ/1 teleprocessing monitor, both software products from Cincom Systems, Inc. Check-in and check-out transactions take place at IBM 3270-type terminals with Recognition Products P-130 OCR readers attached to read the OCR-A book labels and borrowers cards. Because up time is so important for an online system and also because down time, both scheduled and unscheduled, was increasing on ADCOM's IBM 370, the library insisted that a backup computer be installed so that when the 370 should happen to go down, circulation (at least check-out transactions) could continue. A small committee consisting of members from both the ADCOM and library staffs chose an IBM 8130 model A23 distributed processor running the DPCX operating system to serve as the backup

processor and it was installed in Alderman Library.

There were several reasons for choosing a distributed processor instead of a general-purpose minicomputer to handle backup processing. Perhaps the most important reason was that a standard system service that comes with the 8130/DPCX package is a feature called Data Stream Compatibility (DSC). This software enables terminals attached to the 8130 to access programs running on the host computer as if those terminals were themselves directly attached to the host computer. In other words, DSC makes the 8130 "disappear" as far as terminals used for the circulation system (which runs on the host computer) are concerned. Another compelling reason for the choice of the 8130 was its programmability. A DPCX program written to handle backup processing on the 8130 presents a check-out screen very much like the check-out screen presented by the host circulation system. Circulation staff using this program enter check-out transactions that, instead of updating the host circulation system database online, are stored in the 8130's disk subsystem. Once the host circulation system is up again, the stored transactions are transmitted in a batch to the host computer, where a program using these transactions then updates the host circulation system database. Online processing can resume as soon as this batch update has occurred. One other important feature of the distributed processor was that no library staff were required for its operation. ADCOM can control the 8130 from the host computer; all the library has to do is to house the machine.

Host computer down time necessitated the use of the backup capabilities of the distributed processor several times in the early days of the circulation system. The last instance of this was when ADCOM moved from one building to another and from the IBM 370-155 computer to an IBM 4341 computer. The 4341 has proven to be so reliable, however, that since the move the backup processing capability of the distributed processor has not been used a single time. As a result, the library came to use its distributed processor only for DSC (that is, to act as if it weren't there), and the library

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seriously began to consider the possibility of getting rid of it.

CLEMONS LIBRARY

The university opened the Harry Clemons Library amid much fanfare in 1982. Primarily housing a core collection for undergraduates, a reserve book collection, and plentiful seating and study space, the state-of-the-art Clemons Library had a COM catalog produced from OCLC archive records instead of a card catalog. In addition, ADCOM enhanced the online circulation system so that it could be used in Clemons as well as in Alderman. Unfortunately the circulation system was not designed to handle reserve book circulation, even though a substantial portion of the Clemons circulation transactions were reserve book transactions. The clumsy manual checking in and checking out of the reserve books did not fit with the up-to-date image of the Clemons Library. Even more unfortunately, the university chose at this time to realign ADCOM's priorities, which meant that ADCOM could not devote the staff time required to modify the circulation system so it could handle reserve book room circulation.

However, because the library, not ADCOM, had written all the programs for the distributed processor, the library's programming staff had the opportunity to gain a broad understanding of the capabilities of the 8130. Faced with both the need to automate the circulation of reserve books and the unavailability of help from ADCOM, the library decided to design and implement on its own a reserve circulation system for the Clemons Library.

SYSTEM DESIGN

The Clemons reserve circulation system takes advantage of the distributed-processing and data-management features of the IBM 8130. The Clemons reserve-circulation-system database consists of five files: the Basic Item File, the Basic Patron File, the Item Activity File, the Patron Activity File, and the History File. The Item and Patron files are indexed by a nine-digit ID number key and the History File is in-

dexed by a twenty-two-character key. Records in all files may be directly accessed by key. Data in the two Basic files are derived from data maintained by the host circulation system.

The Basic Item File consists of a nine-digit item number (which is printed in OCR-A on a label in the book and which is used by the host circulation system as well), a call number, a sub-call number (containing copy-specific information such as volume, copy number, etc.), a brief author name, a brief title, and a loan period (either two-day or two-hour). All data are copied from the host circulation system's database and are transmitted to the distributed processor by means of an IBM software package known as the Distributed Systems Executive (DSX). These data were originally derived from a snapshot of the host circulation system's current activity file. For each item charged to Clemons Reserve on the host circulation system, host computer programs built a record for transmission to the distributed processor in order to build the original Basic Item File at the distributed processor. From that point on, any charge of an item to Clemons Reserve on the host circulation system generates an "add" transaction for later transmission to the distributed processor in order to update the Basic Item File; likewise, whenever a Clemons Reserve book is checked in on the host circulation system (i.e., taken off reserve) a "delete" transaction is generated for later transmission to the distributed processor. Nightly execution of DSX after the library closes maintains the Basic Item File in batch mode.

The Basic Patron File contains records only for very delinquent borrowers and consists merely of a nine-digit patron ID (the borrower's social security number, which is printed in OCR-A on the patron's library card) and delinquency codes. The original Basic Patron File was constructed from a snapshot of the host circulation system's patron database; only patron records with severe delinquency codes caused Basic Patron File transactions to be built. A DSX job transmitted these transactions to the distributed processor in order to build the original Basic Patron File. Since that time,

whenever a patron becomes sufficiently delinquent on the host circulation system an "add" transaction is generated for later transmission to the distributed processor; whenever a patron atones for his or her delinquency at the host circulation system a "delete" transaction is generated for later transmission to the distributed processor. Nightly DSX transmissions update the Basic Patron File.

A reserve item charge-out transaction writes a record to the Item Activity File. This record contains information from the Basic Item File record plus the date and time of check-out, date and time due, borrower ID number, a code that indicates whether or not the item may be renewed, and the initials of the staff member who may have checked the item out to a delinquent borrower (the Clemons reserve circulation system check-out program blocks delinquent patrons from checking out items, but this block can be overridden).

A record exists in the Patron Activity File if a patron owes a fine and/or has at least one book currently checked out from the Reserve Room collection. The Patron Activity File record contains the nine-digit patron ID, a counter indicating how many books are currently out to that patron, an amount of fines currently owed by that patron, and up to ten item-ID numbers representing the items currently out to that patron (although by rule patrons are supposed to have no more than two reserve items out at any one time).

Check-in transactions result in the deletion of the Item Activity File record, the updating of the Patron Activity File record (or its deletion if the patron owes no fines and has no other reserve books currently checked out), and the writing of a record to the History File. These History File records are either "normal" History File records (no fine was generated when the book was checked in) or "fine" History File records (the book was checked in overdue and a fine was owed). The History File records contain all data from the Basic Item File record, all data from the Item Activity File record, date and time checked in, and, in the case of "fine" History File records, the amount of the fine owed at the time of check-in. Payment or cancellation of a fine

also generates a History File record. These History File records are also coded to indicate either payment or cancellation of a fine and include the amount paid or cancelled, the date and time of the transaction, and the patron ID of the borrower. The History File records are copied to the host computer each night. A program at the host computer logs the records to tape and generates fine notices and regular "statements of account," which are mailed periodically to each borrower for whom History File records were generated within the last period. Once the host computer has processed the copy of the History File it deletes that file from the distributed processor so the next day's transactions can start a new History File. The distributed processor, then, maintains only current data. The host computer maintains a large (and growing) history file, and ADCOM's operations staff takes care of the operator-intensive tasks of mounting tapes and printing large volumes of hard copy. The distributed processor continues to operate virtually unattended.

The Clemons reserve circulation system illustrates well the principles of distributed processing and distributed database: a large, relatively static, shared bibliographic database resides at the host computer; a volatile file of transactions and a unique subset of the bibliographic database reside at the distributed processor; the distributed processor performs all online processing during prime time while the Clemons reserve circulation system relies on the host computer only for batch processing and only at night. In addition, the distributed processor does not require a dedicated operations staff.

APPLICATION OF THE MODEL TO A NETWORK

Consider, then, the application of this distributed processing model to a larger (and probably more appropriate) environment, such as a state library network. Assume that a massive retrospective conversion project has resulted in a huge file of MARC records contributed by the network's member libraries and that this file is regularly augmented by a MARC subscription. The enormous task of maintaining this database, of performing automatic au-

thority control, and of providing online access for the purposes of current cataloging, continued retrospective conversion, and catalog access push the network's computer to its processing limits. How can the network handle the additional, transaction-intensive and local tasks of circulation control and acquisitions?

The answer, of course, is distributed processing. We will assume that the statewide network consists of the central processing site (which maintains the bibliographic database) and a dozen or so regional libraries. Each regional library services a metropolitan area and its surrounding suburbs. A distributed processor placed at each regional library handles the local, online circulation and acquisitions transactions of the regional library and its suburban branches.

The circulation function operates very similarly to the Clemons reserve circulation system. Originally unique subsets of the network's bibliographic database are downloaded to each of the regional nodes. Subsequent changes to the central database generate update transactions which are applied to the regional nodes in batch updates which take place during off-hours. Each of the regional distributed processors maintains its own borrower and activity files.

A DSC-like feature enables terminals attached to the regional node's distributed processor to log onto the online network union catalog running on the host computer, in order to perform current cataloging, retrospective conversion, and union-catalog searching. In the case of interlibrary loans, the requesting library searches the union catalog, discovers a copy of the desired title either at another branch of the same regional node or at another regional node, and routes an ILL request online directly to the holding library. The holding library locates the book, checks it out online, and sends it to the requester with a minimum of delay.

The acquisitions process is somewhat more complex. Fund account data are local to individual regional nodes and should be kept confidential. As a result, the distributed processor should handle fund accounting. On-order files, likewise, are most appropriately maintained at the regional

level. However, it is of networkwide interest to know which regional libraries have specific titles on order, especially if the network is to coordinate collection development statewide. It is also most efficient if the bibliographic data to be contained in the on-order record can be copied from an existing source rather than having to be re-keyed. For these reasons, then, the acquisitions subsystem will involve interactive processing at both the host and distributed levels, with data shared at both levels also.

A typical book order would proceed as follows: The librarian performing the order logs onto the network's online union catalog and searches for the title to be ordered. Upon finding the appropriate record the librarian adds to it the necessary vendor and fund information and then instructs the host computer to process the transaction. The host computer first updates the union catalog holding field to indicate that the title is now on order for the regional library. Then the host computer generates an acquisitions transaction, which contains a subset of the bibliographic record plus vendor and fund account data. This acquisitions transaction is stored at the host computer until it is transmitted to the regional distributed processor that night. At the distributed processor the transaction updates the local on-order file and encumbers the specific local fund account. The distributed processor can also print out a purchase order.

If the title is not found in the network union catalog, the ordering librarian keys in a brief record containing some unique identifier such as ISBN or LCCN so that when the next MARC update is applied to the network's union catalog the bibliographic (but not the holding or on-order) data in the brief record can be matched and replaced with the MARC data. Claiming and receipt are handled at the regional level. In the case of the receipt of an item, a transaction is generated by the distributed processor, which is sent to the host computer that night. The host computer then updates the union catalog record for that title to reflect the fact that the title is no longer on order but has been received at the regional library. In addition, of course, the distributed processor updates local on-

order and fund account files online and logs a history record of the completed transaction to tape for auditing purposes.

ALTERNATIVE NETWORKS

The most common type of library network in operation today is one in which terminals access a central database online by means of leased or dial-up telephone lines. OCLC and RLIN are examples of this type of network, which we can call a centralized network. Anyone who has tried to use either OCLC or RLIN can understand the major drawback of such centralized networks: contention for computer resources by a large network of online terminals results in poor and erratic response times. In fact, in some such networks certain terminals are prohibited from online access during certain times of the day so the other terminals in the network can enjoy satisfactory response time.

Another type of network that has attracted some attention recently is that made up of a number of minicomputers connected to one another by means of leased telephone lines. GEAC and CLSI systems have been linked by means of such networks. The minicomputers in these networks operate autonomously, but are able to pass queries and data between themselves. Each minicomputer requires its own operations staff and maintains its own local database.

A distributed library network presents a number of advantages over any other network arrangement. First of all, the distributed system maintains data of network-wide importance at only one site and provides online access to the data equally to all terminals in the network. In a network consisting of communicating minicomputers, on the other hand, a request to locate a specific title would have to search each regionally maintained database in turn, which in a network of any size would take too long. Also, if the same title were held by more than one regional library, a duplicate bibliographic record would have to be maintained in each library's database. The distributed system also maintains locally, at

each regional distributed processor, data that have only local value. This not only preserves the confidentiality of the data, it also reduces potential contention for host computer resources by limiting access to locally attached terminals, as well as avoiding data redundancy. Large mainframe computers are well suited to the task of maintaining large databases, while minicomputers (and a distributed processor is a kind of minicomputer) are well suited to online transaction processing. This distributed network arrangement takes advantage of the different strengths of the different types of hardware. The distributed model also protects against failure: when one regional node goes down other regions are unaffected; if the host computer goes down programs running on the distributed processors can handle local activity offline. This distributed architecture also permits consistent maintenance of software: the host computer programming staff writes and tests the programs for the distributed processors; that central staff also installs and updates those programs simultaneously on each processor in the distributed network. In addition, the host computer's operational staff can perform all the necessary operational functions of printing hard copy, changing forms and ribbons, and mounting tapes. This frees the regional libraries from the need to support their own operational staffs. This does not mean, however, that certain printed outputs such as purchase orders have to be printed at the central site. The system allows for the routing of output to any printer in the network. Finally, a distributed network cuts costs. It does this primarily by eliminating redundancy of data, redundancy of function, and redundancy of staff, both programming and operational. It also lowers the cost of the host computer, which has to handle only a portion of the network's processing load. All of these advantages increase with the overall size of the network, so the larger the network the greater the savings. For a statewide or national network, such a distributed system could mean the difference between viability and failure. ■■



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Proposed Standard Purchase Order, Variable Format for the Computerized Ordering of Books

Subcommittee U, National Information Standards Organization

Subcommittee U, Computerized Ordering of Books, is working with the National Information Standards Organization (NISO) to provide libraries and vendors with a standard in support of the book ordering/acquisitions process.

The subcommittee was established by Sandra K. Paul in the fall of 1981 and is now supported through the coordination of Mary Ellen Jacob of OCLC. Members of Subcommittee U are: Cynthia L. Cerillo, James K. Long, Robert G. Mall, Sally McCallum, Sara Johnson, Charles Stever, Charles C. Stewart, Susan H. Vita, and Jerome Yavarkovsky. The subcommittee is chaired by Ernest A. Muro.

The primary goal of this subcommittee has been to work with libraries and the book industries to achieve a standard ordering format that provides for common communications between buyer and seller. The subcommittee feels that this goal has been met following the attached variable format that is being released through NISO for membership vote. This variable format, in conjunction with the BISAC fixed format, will take its place as another standard in support of library operations and library interfaces.

Electronic interfaces began with the national and international standards supporting the Z-39 record structure and, specifically, the Z-39.2 MARC record. It is no longer a luxury but a necessity that common interfaces be established in support of the Z-39.2 structure for integration of library functions and the interfaces with those functions for common goals.

Common goals established through standards rely heavily upon compromise to develop and meet the needs of all parties concerned. Expenses are involved for development and implementation of such standards that will provide for concrete, ongoing interfaces. Within the user community, savings derived from the implementation and use of standards will permit open communications and operations efficiencies between libraries and among vendors.

Additionally, libraries are able to participate in the rapid technological advancements and changes that will gain further efficiencies through overhead cost reductions.

The variable format proposal is now in the voting stage and is subject to some change. It is provided through ITAL and LITA for review. Comments and suggestions are welcome.—Ernest A. Muro, Chairman, Subcommittee U, and Vice-President for Technical Services, Baker & Taylor Co., 6 Kirby Ave., Somerville, NJ 08876.

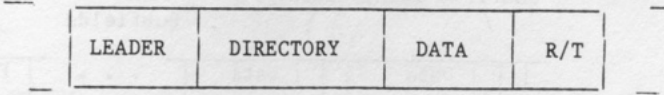
5 PURCHASE ORDER VARIABLE FORMAT

5.1 GENERAL FORMAT STRUCTURE

The structure of this format conforms to that specified in ANSI Z39.2-1979. In this implementation of Z39.2 each record prepared for exchange will consist of:

- a) A LEADER consisting of 24 characters.

- b) A DIRECTORY consisting of a 3-digit tag for each data field and its starting character position relative to the first data field.
- c) DATA FIELDS of variable length, each separated by a field terminator (ASCII hex 1E). The data in these fields, with the exception of field 001, may be subdivided into subfields.
- d) A RECORD TERMINATOR (R/T) at the end of the last data field (ASCII hex 1D).



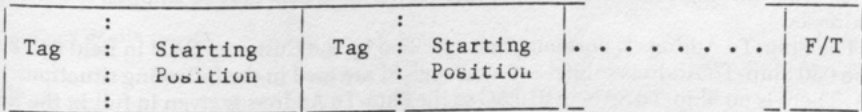
This format is intended to be a carrier format for exchange purposes. It does not stipulate the form, content, or record structure of the data *within* individual systems.

5.1.1 Leader Structure

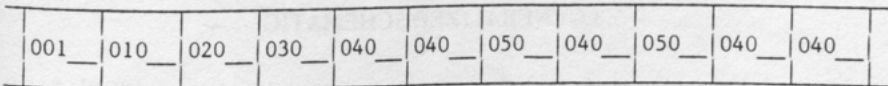
Each record begins with a 24-character LEADER. The LEADER contains data related to the structure of the record, defined within ANSI Z39.2, and several data elements that are defined for this particular implementation of Z39.2. These implementation defined data elements relate to the type of record, record status, and the degree of completeness of the record. The data elements in the LEADER are required primarily to process the record.

5.1.2 Directory Entry Structure

Each entry in the DIRECTORY consists of a 3-digit tag and a 5-digit number indicating the starting character position of the field referenced by the tag. The DIRECTORY is separated from the first DATA FIELD by a Field Terminator (F/T) (ASCII hex 1E).



The directory entries for the 001, 010, 020, and 030 fields should appear before all others in the directory. The subsequent entries for fields 040 and 050 should be contiguous for a given line item and in ascending order by tag. For example:



5.1.3 Data Field Structure

All data in the DATA FIELDS other than that with tag value 001 are allocated to a Subfield. Each Subfield is identified by the 2-character Subfield Identifier composed of a subfield delimiter (ASCII hex 1F) and a subfield code (one alphabetic character) as defined under each field. Each DATA FIELD ends with a Field Terminator.

Data Field 001

Data	:	F/T
	:	

Other Data Fields

Subfield Identifiers				Other Subfields	
/ /		\ \			
	Data		Data	...	F/T

5.2 RECORD CONTENT

Each record is for a purchase order directed to a single vendor although multiple line items may be ordered from that vendor in the record. All business arrangements specified in field 010 are the defaults for a given line item unless that line item carries a subfield with an overriding arrangement.

Bill-To Address:

An order may be billed to only one address. That address is the one indicated on field 010 \$C, Customer SAN, unless there is a field 030 with Customer Bill-To Address subfields \$K through S. The Bill-To Address is not to be confused with the fund ID in the tag 040 \$J. The fund ID is for internal budget allocations at the ordering institution.

Ship-To Addresses:

An order (or single line item for multiple copies) of an item may be shipped to multiple addresses.

The Ship-To Address is normally that specified by the Customer SAN in field 010 \$C. The 030 Ship-To Address subfields \$A through \$I are used in the following situations:

- (1) There is no Ship-To SAN in 010 \$C so the Ship-To Address is given in full in the *first* 030 \$A through \$I.
- (2) There is an address change associated with the SAN in 010 \$C. The new address and the SAN are given in the 030 \$A through \$I.
- (3) Additional ship-to addresses are requested.

If multiple ship-to addresses are required, they are indicated in multiple 030 fields. Orders with multiple Ship-To Addresses must specify in tag 040 \$J exactly how many copies of a line item go to each Ship-To ID.

5.3 GENERALIZED SCHEMATIC

FIELD	POSITION WITHIN		SUB-FIELDS	1	2
	FIXED FIELDS				
Leader (0-23)				M	F
	0 - 4	Record Length		M	F
	5	Status	N = New C = Claim D = Cancel	M	F
	6	Type of Record = P		M	F
	7	Record Level (ISBN Indicator)	A = Acquisitions Level 1 B = Acquisitions Level 2 C = Acquisitions Level 3	M	F

FIELD	POSITION WITHIN		SUB-FIELDS		
	FIXED FIELDS			1	2
	8 - 9		Blank	M	F
	10		0	M	F
	11		2	M	F
	12 - 16		Base Address of Data	M	F
	17		Upper/Lower Case	M	F
			U = Upper Case		
			L = Lower Case		
	18		Format Version Code = 1		
	19		Blank		
	20 - 23		Entry Map = 0500	M	F
Directory (24+)				M	F
	0 - 2		Tag	M	F
	3 - 7		Starting Character Position	M	F
Control Number (Tag 001)				M	
			Date of Transmission = YYMMDD	M	F
			Sequential Number for Date of Transmission	M	
Business Arrangements (Tag 010)				M	
			\$A Purchase Order Number	M	
			\$B Vendor SAN		
			\$C Customer SAN		
			\$D Total Line Items	M	
			\$E Total Units	M	
			\$F Back Order Code		F
			\$G Cataloging Services Code		F
			\$H Cataloging Quantity		
			\$I Substitution Code		F
			\$J Special Handling Codes		
			\$K Do Not Exceed Amount		
			\$L Delayed Billing Month		F
			\$M Special Discount Percent		
			\$N Order Cancellation Date		F
			\$O Do Not Ship Before Date		F
			\$P Special Instructions		
Vendor SAN Details (Tag 020)					
			\$A Vendor Name		
			\$B Address		
			\$C City		
			\$D State or Province		
			\$E Postal Code		
			\$F Country		
			\$G City Subdivision		
			\$H Special Instructions		
Customer SAN Details (Tag 030) (Ship to/Bill to)					
			\$A Customer Ship to Name		
			\$B Address		
			\$C City		
			\$D State or Province		
			\$E Postal Code		
			\$F Country		
			\$G City Subdivision		
			\$H SAN		
			\$I ID		
			\$J Special Instructions		
			\$K Customer Bill to Name		
			\$L Address		
			\$M City		
			\$N State or Province		
			\$O Postal Code		
			\$P Country		
			\$Q City Subdivision		
			\$R SAN		
			\$S State Tax Identification Number		
			\$T Special Instructions		
Line Item (Tag 040)				M	F
			\$A ISBN		F
			\$B Quantity	M	
			\$C Line Item No.	M	
			\$D Customer Item No.		
			\$E Price		
			\$F Back Order Code		F
			\$G Cataloging Services Code		F
			\$H Cataloging Quantity		
			\$I Substitution Code		F
			\$J Quantity/Ship to ID/Fund ID		
			\$K Media Type		
			\$L Item Cancel Date		
			\$M Discount Percent		
			\$N Claim Number		
			\$O Special Instructions		

<u>FIELD</u>	<u>POSITION WITHIN FIXED FIELDS</u>	<u>SUB-FIELDS</u>	<u>1</u>	<u>2</u>
Additional Line Item Information (Tag 050)				
		\$A Title		
		\$B Author		
		\$C Edition		
		\$D Volume Set		
		\$E Number of Part or Section		
		\$F Name of Part or Section		
		\$G Binding Code		F
		\$H Publisher		
		\$I Publication Date		
		\$J Distributor		
		\$K LCCN		
		\$L Alternate ISBN		F
		\$M Alternate Author		
		\$N Illustrator		
		\$O Translator		
		\$P Performer or Performing Group		
		\$Q Extent of Item		
		\$R Other Characteristics		
		\$S Dimensions		
		\$T Accompanying Material		
		\$U Languages		
		\$V Series Title/Volume Number		
		\$W Series ISSN/ISBN		
		\$X Special Instructions		

Column 1: M = Mandatory; Blank = Optional

Column 2: F = Fixed length; Blank = Variable length

5.4 EXAMPLES

Sample Leader and Directory for Acquisitions Level 1 (Below)

	<u>Position/Label</u>		<u>Data</u>	
<u>LEADER</u>	0 - 4	Record Length	00140	
	5	Status	N	
	6	Type	P	
	7	Level	1	
	8 - 9	Reserved Positions	bb	
	10	Indicator Count	0	
	11 - 12	Identifier Length	2	
	13 - 16	Base Address	00067	
	17	Upper/Lower	U	
	18	Version	1	
	19	Blank	b	
	20 - 23	Entry Map	0500	
	<u>DIRECTORY</u>	24 - 31	Tag 001	00100000
		32 - 39	Tag 010	01000008
40 - 47		Tag 040	04000057	
48		Tag 040	04000077	
56		F/T		

Sample Variable Data for Acquisitions Records - Levels 1, 2 and 3

ACQUISITIONS LEVEL 1 (a)		ACQUISITIONS LEVEL 2 (b)				ACQUISITIONS LEVEL (c)	
WITH SANS AND ISBN		WITHOUT SANS		WITH SANS AND MULTIPLE SHIP TO		WITHOUT ISBN	
TAG	VARIABLE DATA	TAG	VARIABLE DATA	TAG	VARIABLE DATA	TAG	VARIABLE DATA
001	8403011 F/T	001	8403012 F/T	001	8403013 F/T	001	8403014 F/T
010	\$A 1 \$B 1234567 21 \$C 7654321 33 \$D 2 \$E 6 F/T	010	\$A 2 \$D 1 \$E 5 F/T	010	\$A 3 \$B 1234567 \$C 7654321 10 \$D 1 \$E 5 \$P Multiple Destinations	010	\$A POW4125 \$D 1 \$E 5 \$P Multiple Destinations F/T
		020	\$A GREAT BOOKS \$B 10 LOCUST RD \$C GEORGETOWN \$D MD \$E 99999 \$H RUSH F/T	030	\$A BRANCH1 \$B ATHENS P.L. \$B FLAMER ST \$C ATHENS \$D AZ \$E 77777 \$H 7654321 11 F/T	030	\$A SPARTA CENTRAL LIB \$B 5 MAIN ST \$C SPARTA \$D AZ \$E 66666 \$I ID 1234 \$K BILLING OFFICE \$L SPARTA SYSTEM \$M 1000 BANK ST \$N SPARZA \$O AZ \$P 66667 F/T
		030	\$A UNION P.L. \$B 33 MAIN ST \$C UNION \$D AZ \$E 88888 F/T	030	\$A BRANCH2 \$B ATHENS P.L. \$B SHRUB ST \$C ATHENS \$D AZ \$E 77780 \$I 7654321 22 F/T	030	\$A TROY HILLS BR \$B SPARTA LIBRARY SYSTEM \$B 50 POPLAR ST \$C TROY HILLS \$D AZ \$E 66668 \$I ID 5678 F/T
040	\$A 0684103176 \$B 5 \$C 1 F/T	040	\$A 0684103176 \$B 5 \$C 1 F/T R/T	040	\$A 0684103176 \$B 5 \$C 1 \$J 1/10 \$J 1/11 \$J 3/22 F/T	040	\$B 5 \$C 1 \$J 2/ID 1234 \$J 3/ID 5678 F/T
040	\$A 0688014291 \$B 1 \$C 2 F/T R/T					050	\$A MAN'S SEARCH \$G PAP \$H NEW AMERICAN \$I 1967 F/T R/T

a) The basic record
 b) Alternate SAN format
 c) All data manually entered

5.5 DESCRIPTIONS OF DATA ELEMENTS

LEADER

Required

Fixed Length, 24 characters, i.e., positions 0-23

Alphanumeric

Nonrepeatable

Contents of the Leader:

*Char.**Pos. Name and Description*

- | | | |
|-----|-----|--|
| LDR | 0-4 | <p>RECORD LENGTH</p> <p>Required</p> <p>Fixed Length, 5 characters</p> <p>Numeric; Right justified, with leading zeros</p> <p>Nonrepeatable</p> <p>The total number of characters in the purchase order record. Practical use and transmission arrangements may suggest that less than the maximum length of 99,999 be used.</p> |
| LDR | 5 | <p>STATUS CODE</p> <p>Required</p> <p>Fixed Length; 1 character</p> <p>Alphanumeric</p> <p>Nonrepeatable</p> <p>This code indicates the relation of the purchase order record to the vendor's file. Values:</p> <p style="margin-left: 2em;">N = New record</p> <p style="margin-left: 2em;">C = Claim</p> <p style="margin-left: 2em;">C = Cancel</p> |
| LDR | 6 | <p>TYPE OF RECORD</p> <p>Required</p> <p>Fixed Length, 1 character</p> <p>Alphanumeric; for this application the value is always P.</p> <p>Nonrepeatable</p> <p>This code, in conjunction with Record Level, specifies the characteristics and defines the components of the record.</p> |
| LDR | 7 | <p>RECORD LEVEL CODE</p> <p>Required</p> <p>Fixed Length; 1 character</p> <p>Alphabetic</p> <p>Nonrepeatable</p> <p>This code is used to indicate the degree of complexity of the record. For examples which illustrate how these levels are treated in this format, see section 5.4. Values:</p> <p style="margin-left: 2em;">A = Acquisition Level 1. This is the minimum information required to transmit an order, i.e., only the SANs and ISBNs are transmitted. Authors, titles, addresses, etc., are not expressed, except by ISBN or SAN. Level 1 records would include only tags 001, 010, and 040, although there may be multiple 040 tags.</p> <p style="margin-left: 2em;">B = Acquisitions Level 2. Records with Level 2 status will include a combination of SANs and ISBNs with vendor or customer ship-to and/or bill-to amplification, e.g., tags 001, 010, 020, 030, and 040.</p> <p style="margin-left: 2em;">C = Acquisitions Level 3. Records with Level 3 status include amplified Line Item Information in addition to the information included either in Level 1 or 2, e.g., 001, 010, 020, 030, 040, 050.</p> |
| LDR | 8-9 | <p>RESERVED POSITIONS</p> <p>Required</p> <p>Fixed Length; 2 characters</p> <p>Value is $\text{\textcircled{b}}$</p> <p>Nonrepeatable</p> |

- LDR 10 LENGTH OF FIELD INDICATORS.
 Required
 Fixed Length, 1 character
 Numeric, value is 0
 Nonrepeatable
 The number of indicators associated with each variable field. In this case no indicators are used, so the value is 0.
- LDR 11 SUBFIELD IDENTIFIER LENGTH
 Required
 Fixed Length; 1 character
 Numeric; value is 2
 Nonrepeatable
 The length of the delimiter plus the subfield code used within the fields.
- LDR 12-16 BASE ADDRESS OF DATA
 Required
 Fixed Length; 5 Characters
 Numeric, Right justified; Zero-filled
 Nonrepeatable
 This is the sum of the lengths of the leader and the directory, including the field terminator at the end of the directory.
- LDR 17 UPPER/LOWER CASE CODE
 Required
 Fixed Length, 1 character
 Alphanumeric
 Nonrepeatable
 A code which indicates whether the data transmitted is in upper case only or in both upper and lower case. Values:
 U = Upper Case Only
 L = Upper and Lower Case
- LDR 18 FORMAT VERSION CODE
 Required
 Fixed Length; 1 character
 Numeric; the value for this version is 1
 Nonrepeatable
 The format used in creating the file.
- LDR 19 RESERVED POSITION
 Required
 Fixed Length; 1 character
 Value is blank
 Nonrepeatable
- LDR 20-23 ENTRY MAP
 Required
 Fixed Length; 4 characters
 Numeric; the values are always 0500
 Nonrepeatable
 This specifies the structure of the entries in the directory.

DIRECTORY

Required
 Variable Length
 Numeric
 Nonrepeatable
 The Directory begins with character position 24. It is an index to the location of the variable fields within a record. It is made up of a series of fixed length entries.
 Each of these entries includes the identification tag and the starting character position of the referenced field. The Directory ends with a field terminator (ASCII hex 1E).
 Contents of *each* Directory *entry*:

<i>Char.</i>	
<i>Pos.</i>	<i>Name and Description</i>
0-2	TAG Required Fixed Length; 3 characters Numeric A 3-character number that identifies a variable field. Tags in this application include: 001—Control Number 010—Business Arrangements 020—Vendor SAN Details 030—Customer SAN Details 040—Line Items 050—Additional Line Item Information Specifics about each of these fields will be found below.
3-7	STARTING CHARACTER POSITION Required Fixed Length; 5 characters; Right justified; Zero-filled Numeric A 5-character number which identifies the position in the record of the first character of a field (relative to the base address of the data), e.g., 00039. The first character of the first field following the directory is numbered 0.

CONTROL NUMBER—TAG 001

Required
Variable Length
Alphanumeric
Nonrepeatable

The control number, in this application, is a number assigned by the organization transmitting the record. The control number uniquely identifies the record within the orders issued by the sender. This field does not have subfields.

<i>Tag</i>	<i>Pos.</i>	<i>Name and description</i>
001	0-5	DATE OF TRANSMISSION Required Fixed Length, 6 characters Numeric; expressed as YYMMDD Nonrepeatable The date on which the purchase order was transmitted.
	6 +	SEQUENTIAL NUMBER FOR DATE OF TRANSMISSION Required Variable Length Alphanumeric Nonrepeatable An identifier which differentiates between multiple records sent to a vendor in a given day.

BUSINESS ARRANGEMENTS—Tag 010

Required
Variable Length
Alphanumeric
Nonrepeatable

This field is mandatory, although not all the subfields are mandatory. (Total Line Items, and Total Units are mandatory subfields). Tag 010 includes a group of subfields which comprise the minimum business information necessary to enable a vendor to fulfill the order. Instructions appearing in tag 010 apply to everything in the purchase order, unless specifically overridden or specified by information in tags 020 or 030 or 040. The field is not repeatable, although subfield J, Special Handling Codes, may be repeated.

Tag	Subf. Code	Name and Description
010	\$A	<p>PURCHASE ORDER NUMBER Required Variable Length Alphanumeric Nonrepeatable</p> <p>This is the customer assigned identification number for the order. The purchase order number in this subfield applies to the entire record. (Users of this standard who wish to assign a different purchase order to each line item should put the multiple purchase order numbers in subfield C of the 040 fields.)</p>
010	\$B	<p>VENDOR SAN Optional Variable Length Numeric Nonrepeatable</p> <p>The unique Standard Address Number of the vendor. This subfield may also include a non-standard local differentiator (suffix) associated with the SAN, indicating a sublocation within the address. The suffix is 4 digits or less, and follows the SAN, separated from it by a blank, e.g., 1234567b12.</p>
010	\$C	<p>CUSTOMER SAN Optional Variable Length Numeric Nonrepeatable</p> <p>The unique Standard Address Number of the customer. This Customer SAN and suffix subfield specifies the Bill-To and Ship-To location, unless overridden in tag 030. In the case where a customer has multiple SANS, the governing, or master SAN for this purchase order should be put here. This subfield may also include a non-standard, local differentiator (suffix) associated with the SAN, indicating a sublocation within the address. The suffix is 4 digits or less, and follows the SAN, separated from it by a blank, e.g., 1234567b12.</p> <p>If there is no 010 \$C, the customer Bill-To and Ship-To name and address must be specified in field 030.</p>
010	\$D	<p>TOTAL NUMBER OF LINE ITEMS Required Variable Length Numeric Nonrepeatable</p> <p>The total number of titles ordered in this purchase order record.</p>
010	\$E	<p>TOTAL UNITS ORDERED Required Variable Length Numeric Nonrepeatable</p> <p>The total quantity represented by all individual line items contained in this purchase order record.</p>
010	\$F	<p>BACK-ORDER CODE Optional Fixed Length; 1 character Alphanumeric Nonrepeatable</p> <p>This code instructs the vendor whether or not to back-order out-of-stock items for all line items within the purchase order.</p> <p>If back-order instructions vary from title to title, field 040, subfield F should be used instead, and subfield F will not appear.</p> <p>If there are no back-order instructions, subfield F will not appear in the record. Values:</p>

N = Do not back-order titles in this record.

Y = Back-order if titles are out-of-stock or not yet published.

B = Back-order only if titles are not yet published.

010 \$G CATALOGING SERVICES CODE

Optional

Fixed Length; 1 character

Numeric

Nonrepeatable

This code informs the vendor what type of cataloging services are desired for all titles in the order. If cataloging instructions vary from title to title, field 040 \$G should be used instead.

If no cataloging services are desired, subfield G will not appear in the record. Values:

1 = Full processing is desired.

2 = Partial processing is desired.

3 = Supply kits with the item.

4 = Prepare cards for each title.

5 = Other specifications, as determined by the customer and vendor, apply.

010 \$H CATALOGING QUANTITY

Optional

Variable Length

Alphanumeric

Nonrepeatable

This specifies the number of catalog components, e.g., number of card sets, or kits, desired, if the number is different from the quantity ordered of the corresponding title.

If cataloging quantity instructions vary from title to title, field 040, Subfield H should be used instead. Subfield H appears only if Subfield G is present.

010 \$I SUBSTITUTION CODE

Optional

Fixed Length; 1 character

Numeric

Nonrepeatable

This code indicates whether another type of binding may be substituted whenever a book is unavailable in the binding requested by the customer.

If substitution instructions vary from title to title, field 040 \$I should be used instead. Values:

0 = No substitution is permitted.

1 = Supply any available binding if edition ordered is not available.

2 = Supply the paper binding if the edition ordered is not available.

3 = Supply the cloth binding if the edition ordered is not available.

4 = Supply the library binding if the edition ordered is not available.

010 \$J SPECIAL HANDLING CODE

Optional

Variable Length; Multiples of 3 characters

Numeric

Nonrepeatable

A code to indicate customer specified special handling instructions for this order. Values:

1XX = Number of copies of vendor's invoice that are required by the customer. XX will contain that information, e.g.,

105 = 5 copies.

2XX = Disposition of invoice.

201 = Attach invoice to outside of carton marked *invoice*.

202 = Attach invoice to outside of package.

203 = Enclose invoice and mark carton *invoice enclosed*.

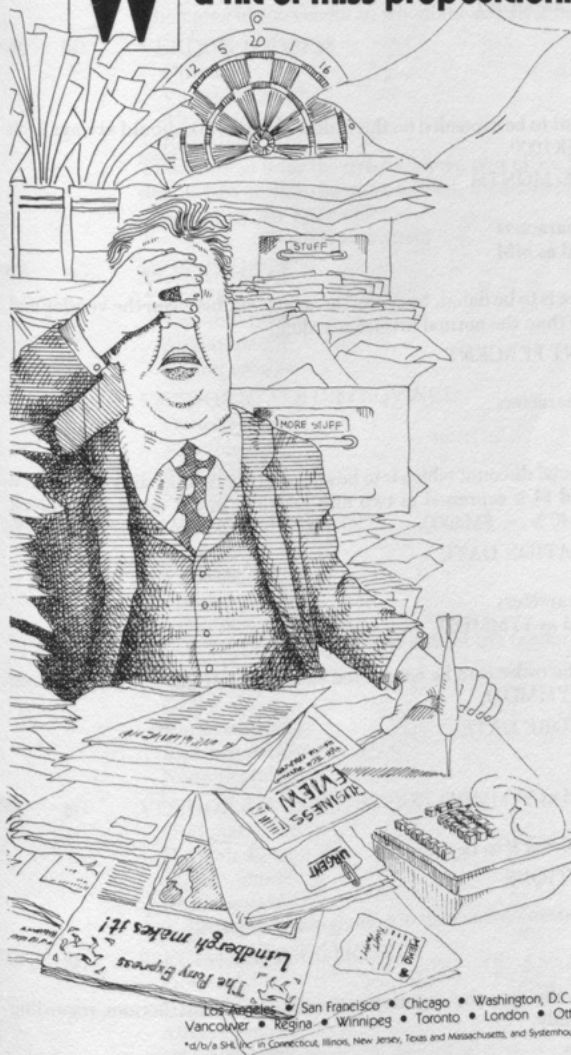
3XX = Sequencing on invoice

301 = Provide invoice in same sequence as order.

302 = Provide invoice in ISBN sequence.

303 = Provide invoice in author sequence.

With MINISIS, Database Management isn't a hit or miss proposition.



Database management (the exacting art of finding things in the Information Age) is becoming increasingly important to all manner of organizations that have to maintain, manipulate and retrieve large volumes of information.

The famous Cranshaw Method (pictured on the left) is fast becoming a thing of the past. But, there are a lot of database systems out there that can make you feel like Cranshaw - with a keyboard instead of a dartboard.

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- 4XX = Shipping instructions
 - 401 = Ship best method
 - 402 = UPS (United Parcel Service)
 - 403 = Book Post
 - 404 = Freight
 - 405 = Hold for pickup
 - 406 = Air Express

Other codes will be established among users as required.

Multiple instructions can be specified in this subfield, e.g., \$J101202302406.

If special handling instructions, different from the instructions which pertain to the majority of the titles in the order are needed for individual titles, put them in the 040 field subfield 0, Special Instructions.

010 \$K DO-NOT-EXCEED AMOUNT

- Optional
- Variable Length
- Numeric
- Nonrepeatable

The maximum amount to be expended on this order. The amount should always be in whole dollars, e.g., \$K1000.

010 \$L DELAYED BILLING MONTH

- Optional
- Fixed Length; 2 characters
- Numeric; expressed as MM
- Nonrepeatable

The month the invoice is to be dated, by special arrangement between the vendor and the customer, if later than the normal invoice schedule.

010 \$M SPECIAL DISCOUNT PERCENT

- Optional
- Fixed Length; 5 characters
- Numeric
- Nonrepeatable

A time dependent special discount which is to be added to the regular discount, e.g., a special offer. Subfield M is expressed as two unit positions and 1 decimal (decimal point implied), e.g., 40% = \$M4000.

010 \$N ORDER CANCELLATION DATE

- Optional
- Fixed Length; 6 characters
- Numeric; expressed as YYYYMMDD
- Nonrepeatable

The date on which the order is to be considered cancelled if it has not already been filled. Expressed as YYYYMMDD.

010 \$O DO-NOT-SHIP-BEFORE DATE

- Optional
- Fixed Length
- Numeric; expressed as YYYYMMDD
- Nonrepeatable

The earliest date the order is to be shipped.

010 \$P SPECIAL INSTRUCTIONS

- Optional
- Variable Length
- Alphanumeric
- Nonrepeatable

A free form subfield allowing the communication of special instructions regarding data in the 010 field only.

VENDOR SAN DETAILS—Tag 020

Optional, unless there is no 010 \$B, Vendor SAN

Variable Length; 3 characters

Alphanumeric

Nonrepeatable

This tag includes a group of subfields which allow the input of the vendor's name and address. These subfields may be used to supplement the vendor SAN. They are also used when there is no vendor SAN.

Subf.

Tag	Code	Name and Description
020	\$A	VENDOR NAME Optional; unless there is no tag 010 \$B Vendor SAN. Variable Length Alphanumeric Nonrepeatable The name of the vendor to whom the record is being sent.
020	\$B	VENDOR ADDRESS Optional Variable Length Alphanumeric Repeatable This subfield is for the street address, post office box, route number, etc., of the vendor. If two or more lines are needed, the subfield should be repeated for each line. Example: \$B Suite 647 \$B 123 Main Street
020	\$C	VENDOR CITY Optional Variable Length Alphanumeric Nonrepeatable
020	\$D	VENDOR STATE OR PROVINCE Optional Variable Length Alphanumeric Nonrepeatable
020	\$E	VENDOR POSTAL CODE Optional Variable Length Alphanumeric Nonrepeatable This is the zip code or address code of the vendor.
020	\$F	VENDOR COUNTRY Optional Variable Length Alphanumeric Nonrepeatable
020	\$G	VENDOR CITY SUBDIVISION Optional Variable Length Alphanumeric Nonrepeatable Any district or borough used in the vendor's address.
020	\$H	SPECIAL INSTRUCTIONS Optional Variable Length Alphanumeric Nonrepeatable A free form subfield allowing the communication of special instructions regarding data in the 020 field only.

CUSTOMER SAN AMPLIFICATIONS (SHIP-TO/BILL-TO)—Tag 030

Optional; unless there is no 010 \$C, Customer SAN

Variable Length

Alphanumeric

Repeatable

This field includes a group of subfields which allow the input of the customer's bill-to and ship-to address, in amplification of information in 010, or in the absence of a customer SAN, plus other special instructions. It is repeatable to accommodate multiple ship-to addresses. When an order has multiple ship-to's, then the additional ship-to's may be specified using 030 tags. Subfield J in tag 040 must be used for each line item ordered to specify which ship-to is to be used. The SAN suffix may be used as the ship-to ID, unless another identification number is specified in tag 030 \$I.

Tag	Subf. Code	Name and Description
030	\$A	CUSTOMER SHIP-TO NAME Optional, unless there is no 010\$C Customer SAN Variable Length Alphanumeric Nonrepeatable The name of the customer to whom the item is being sent.
030	\$B	CUSTOMER SHIP-TO ADDRESS Optional Variable Length Alphanumeric Nonrepeatable This subfield is for the street address, post office box, route number, etc. of the customer. If two or more lines are needed, the subfield should be repeated for each line. Example: \$BReference Department \$B350 Campus Drive
030	\$C	CUSTOMER SHIP-TO CITY Optional Variable Length Alphanumeric Nonrepeatable
030	\$D	CUSTOMER SHIP-TO STATE OR PROVINCE Optional Variable Length Alphanumeric Nonrepeatable
030	\$E	CUSTOMER SHIP-TO POSTAL CODE Optional Variable Length Alphanumeric Nonrepeatable This is the zip code or address code of the customer.
030	\$F	CUSTOMER SHIP-TO COUNTRY Optional Variable Length Alphanumeric Nonrepeatable
030	\$G	CUSTOMER SHIP-TO CITY SUBDIVISION Optional Variable Length Alphanumeric Nonrepeatable Any district or borough used in the customer's address.
030	\$H	CUSTOMER SHIP-TO SAN

Optional
Variable Length
Numeric
Nonrepeatable

The customer's unique Ship-To Standard Address Number. This subfield may also include a non-standard, local differentiator (suffix) associated with the SAN, indicating a sublocation within the address. The suffix is 4 digits or less, and follows the SAN, separated from it by a blank, e.g., 1234567b12. This suffix serves as the ship-to ID, unless overridden by \$I. Subfields A-C are not needed if subfield H is available.

030 \$I CUSTOMER SHIP-TO IDENTIFICATION NUMBER

Optional
Variable Length
Alphanumeric
Nonrepeatable

A number to designate the particular customer ship-to name and address in tag 040 \$J.

030 \$J SPECIAL INSTRUCTIONS

Optional
Variable Length
Alphanumeric
Nonrepeatable

A free form subfield allowing the communication of special instructions regarding the 030 field, ship-to arrangements.

030 \$K CUSTOMER BILL-TO NAME
Optional, unless there is no customer SAN
Variable Length
Alphanumeric
Nonrepeatable

030 \$L CUSTOMER BILL-TO-ADDRESS
Optional
Variable Length
Alphanumeric
Repeatable

This subfield is for the street address, post office box, route number, etc., of the customer. If two or more lines are needed, the subfield should be repeated for each line.

Example: \$LAcquisitions Department
\$L350 Campus Drive

030 \$M CUSTOMER BILL-TO CITY
Optional
Variable Length
Alphanumeric
Nonrepeatable

030 \$N CUSTOMER BILL-TO STATE OR PROVINCE
Optional
Variable Length
Alphanumeric
Nonrepeatable

030 \$O CUSTOMER BILL-TO POSTAL CODE
Optional
Variable Length
Alphanumeric
Nonrepeatable

030 \$P CUSTOMER BILL-TO COUNTRY
Optional
Variable Length
Alphanumeric
Nonrepeatable

030 \$Q CUSTOMER BILL-TO CITY SUBDIVISION

- Optional
Variable Length
Alphanumeric
Nonrepeatable
- 030 \$R CUSTOMER BILL-TO SAN
Optional
Variable Length
Alphanumeric
Nonrepeatable
The customer's unique bill-to Standard Address number. This subfield may also include a non-standard, local differentiator (suffix) associated with the SAN, indicating a sublocation within the address. The suffix is 4 digits or less, and follows the SAN, separated from it by a blank, e.g., 1234567b12. This subfield is needed when the customer SAN in tag 010 \$C is not the bill-to address or if tag 010 \$C is not present. Subfields K-Q are not needed if subfield R is available.
- 030 \$\$ STATE TAX IDENTIFICATION NUMBER
Optional
Variable Length
Alphanumeric
Nonrepeatable
The identification number required by a state for tax purposes.
- 030 \$T SPECIAL INSTRUCTIONS
Optional
Variable Length
Alphanumeric
Nonrepeatable
A free form subfield allowing the communication of special instructions regarding the 030 field, bill-to arrangements, e.g., Fund I.D. (needed in 040 \$J).

LINE ITEMS—Tag 040

Required
Variable Length
Alphanumeric
Nonrepeatable

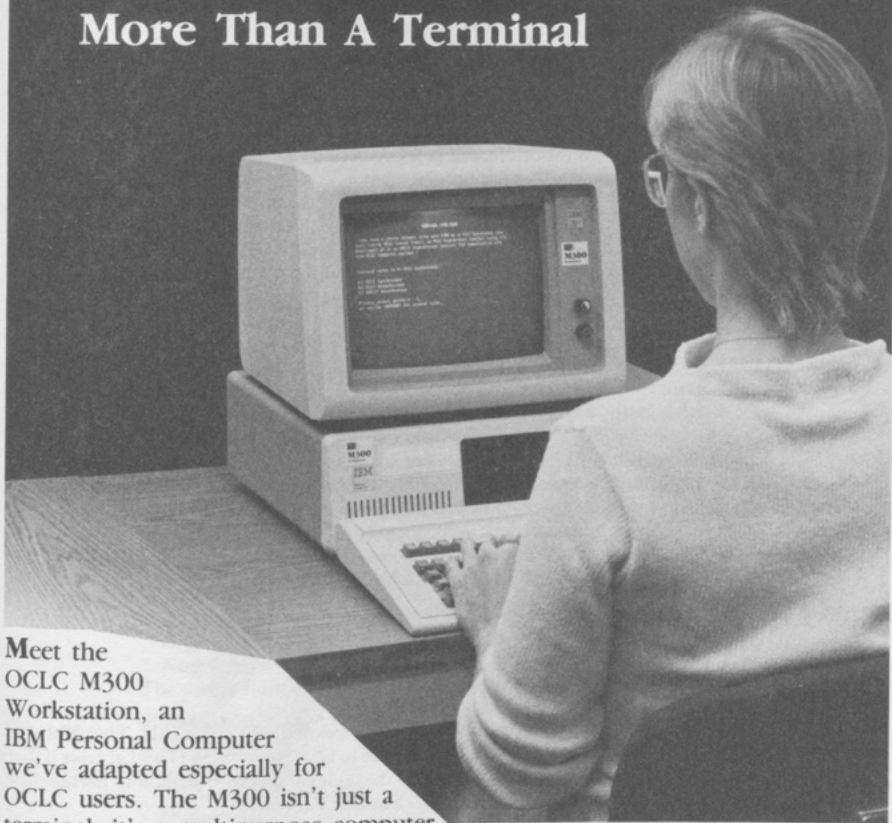
This field includes a group of subfields which define each line item. In field 040 instructions for specific services for each line item are described. This field is repeatable—there will be a separate 040 field for every title being ordered. Each 040 may have an 050 tag paired with it to expand the information which describes it. See Section 5.4 for examples of its use.

Subf.

<i>Tag</i>	<i>Code</i>	<i>Name and Description</i>
------------	-------------	-----------------------------

- | | | |
|-----|-----|---|
| 040 | \$A | ISBN
Optional
Fixed Length; 10 characters
Alphanumeric
Nonrepeatable
The International Standard Book Number of the title being ordered, or cancelled, or claimed. The subfield is 10 characters long; hyphens are not expressed. |
| 040 | \$B | QUANTITY
Required
Variable Length
Numeric
Nonrepeatable
This specifies the total number of copies of a title and includes the sum of all quantities that are being ordered. Quantity may also be indicated in Subfield J. Subfield J is required when there are multiple ship-to locations or multiple fund IDs for the line item. |
| 040 | \$C | LINE ITEM NUMBER
Required |

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- Variable Length
Alphanumeric
Nonrepeatable
This is a sequential number which identifies each separate line item in the purchase order record.
- 040 \$D CUSTOMER ITEM NUMBER
Optional
Variable Length
Alphanumeric
Nonrepeatable
A unique local identifier for the item that may be used for local information interface, e.g., typing an acquisitions record to a circulation record.
- 040 \$E PRICE
Optional
Variable Length
Numeric
Nonrepeatable
This is the estimated list price of a single copy of the item being ordered. The decimal point is always implied, e.g., \$14.95 = \$D1495.
- 040 \$F BACK-ORDER CODE
Optional
Fixed Length; 1 character
Alphanumeric
Nonrepeatable
This is a code to indicate whether or not to back-order out-of-stock items. No subfield F will appear if there are no back-order instructions. Values:
N = Do not back-order.
Y = Back-order if out-of-stock, or not-yet-published.
B = Back-order only if not-yet-published.
- 040 \$G CATALOGING SERVICES CODE
Optional
Fixed Length; 1 character
Numeric
Nonrepeatable
This code details the nature of cataloging services desired for this title. This subfield is used if cataloging instructions vary from title to title. No subfield G will appear if there are no cataloging services instructions. If the same cataloging instructions pertain to all the titles in the order, use field 010 \$G instead. Values:
1 = Provide full processing.
2 = Provide partial processing.
3 = Provide kits with the title.
4 = Provide cards with the title.
5 = Follow other specifications as determined by customer and vendor agreement.
- 040 \$H CATALOGING QUANTITY
Optional
Variable Length
Numeric
Nonrepeatable
This specifies the number of catalog components, e.g., number of kits, desired, if the number is different from the quantity of the title that is ordered. Subfield H appears only if subfield G is present. If the same cataloging quantity instructions pertain to all titles in the order, use field 010 \$H instead.
- 040 \$I SUBSTITUTION CODE
Optional
Fixed Length; 1 character
Numeric

Nonrepeatable

This code indicates whether another type of binding may be substituted when a title is unavailable in the binding requested. This subfield is used if substitution instructions vary from title to title. If no subfield I appears, whatever standard instructions are on file for this customer apply to this title. If the same instructions pertain to all the titles in this order, use field 010 \$H instead. Values:

- 0 = No substitutions are allowed.
- 1 = Supply any binding available if the edition ordered is not available.
- 2 = Supply the paper binding if the edition ordered is not available.
- 3 = Supply the cloth binding if the edition ordered is not available.
- 4 = Supply the library binding if the edition ordered is not available.

040 \$J

QUANTITY/SHIP-TO ID/FUND ID

Optional; Required if there are multiple ship-to addresses

Variable Length

Alphanumeric

Repeatable

This subfield specifies the quantity to be shipped to an unique ship-to address or debited to an unique fund. The three different elements—Quantity, Ship-To ID, and Fund—are separated by slashes (/). Example: \$J5/0401/Hist1.

The Quantity specified in subfield J is given *in addition* to having been counted in subfield B, i.e., the sum of all subfield Js in each 040 field should equal the quantity listed in subfield B.

The Ship-To ID portion of this subfield is a unique number which identifies the ship-to address for the item.

The Fund ID is a code that identifies the fund that the title is to be debited against. The Fund ID portion of this subfield is for local use in facilitating in-house fund allocation. It should not be confused with the Customer Bill-To Address, 030\$K-R, used by the vendor in billing operations.

040 \$K

MEDIA TYPE

Optional

Variable Length

Alphanumeric

Nonrepeatable

The media format of the item being ordered.

040 \$L

ITEM CANCEL DATE

Optional

Variable Length

Alphanumeric; expressed as YYYYMMDD

Nonrepeatable

The date on which an order for one item in the purchase order is to be considered cancelled if it has not already been filled. If the same cancellation date applies to all the titles in this order, use field 010 \$N instead.

040 \$M

DISCOUNT PERCENT

Optional

Variable Length; 5 characters

Numeric

Nonrepeatable

The discount the customer expects to receive on the list purchase price of this title. If the same discount percent applies to all the titles in this order use field 010 \$M instead. Three decimal places are implied here, e.g., 35% = 35000, 41.125% = 41125.

040 \$N

CLAIM NUMBER

Optional

Variable Length

Alphanumeric

Nonrepeatable

This is a number to be used for unique identification of a claim. For example, it can be used to relate a claim to an earlier purchase order number.

040 \$O SPECIAL INSTRUCTIONS

Optional
Variable Length
Alphanumeric
Nonrepeatable

A free form subfield allowing the communication of special instructions regarding the 040 field in this purchase order record.

ADDITIONAL LINE ITEM INFORMATION—*Tag 050*

Optional; Required if no ISBN
Variable Length; 3 characters
Alphanumeric
Repeatable

This field includes a group of subfields which describe in detail the specific title being ordered. The presence of field 050 automatically makes the record an Acquisition Level 3 record. It should be used when there is no ISBN in the 040 field, or to amplify the ISBN. This field is repeatable—there will be a separate 050 field for every title that needs additional information to supplement that found in the 040 field. See Section 5.4, Acquisitions Level 3, for an example of its use.

<i>Tag</i>	<i>Code</i>	<i>Name and Description</i>
050	\$A	TITLE Optional Variable Length Alphanumeric Nonrepeatable The title and other title information of the item being ordered.
050	\$B	AUTHOR Optional Variable Length Alphanumeric Nonrepeatable The name of the person or corporate body responsible for the creation of the intellectual or artistic content of the item being ordered.
050	\$C	EDITION Optional Variable Length Alphanumeric Nonrepeatable A designation of the edition or version of publication for the item being ordered.
050	\$D	VOLUMES IN SET Optional Variable Length Numeric Nonrepeatable The number of volumes in the set.
050	\$E	NUMBER OF PART OR SECTION Optional Variable Length Alphanumeric Nonrepeatable The number of the part or section being ordered of a multipart item.
050	\$F	NAME OF PART OR SECTION Optional Variable Length Alphanumeric Nonrepeatable The name of the part or section being ordered of a multipart item.

- 050 \$G BINDING CODE
 Optional
 Fixed Length; 1 character
 Alphanumeric
 Nonrepeatable
 This code specifies the type of binding requested for the item being ordered. If the binding is not specified subfield G will not appear. Values:
 P = Paper
 C = Cloth
 L = Library
 O = Other
- 050 \$H PUBLISHER
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The name and/or address of the publisher of the item being ordered.
- 050 \$I PUBLICATION DATE
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The publication date or copyright date or projected publication date associated with the item being ordered. This is a free form description.
- 050 \$J DISTRIBUTOR
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The distributor of the item being ordered.
- 050 \$K LC NUMBER
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The Library of Congress Catalog Card Number for the item being ordered.
- 050 \$L ALTERNATE ISBN
 Optional
 Fixed Length; 10 characters
 Alphanumeric
 Repeatable
 An alternate or obsolete ISBN by which the title may be known. This field is repeatable when there are multiple ISBN's for multipart items.
- 050 \$M OTHER NAMES ASSOCIATED WITH THE ITEM
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 An alternate personal, corporate or meeting/conference name associated with the item being ordered, e.g., co-authors.
- 050 \$N ILLUSTRATOR
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The name of the illustrator of the item being ordered.

- 050 \$O TRANSLATOR
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The name of the translator of the item being ordered.
- 050 \$P PERFORMER OR PERFORMING GROUP
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The performer or performing group of the item being ordered.
- 050 \$Q EXTENT OF ITEM
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The number and type of physical units included with the item being ordered, e.g., number of: pages, reels, transparencies, disks, etc.
- 050 \$R OTHER CHARACTERISTICS
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 A further physical description of the item being ordered, e.g., color, processing, etc.
- 050 \$S DIMENSIONS
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The technical specifications of the item being ordered, e.g., 16mm, 1/2 in, 1500 rpm, etc.
- 050 \$T ACCOMPANYING MATERIAL
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 Other material included with the item being ordered, e.g., instructional pamphlets, guide manuals, etc.
- 050 \$U LANGUAGE
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The languages of the item being ordered.
- 050 \$V SERIES TITLE/VOLUME NUMBER
 Optional
 Variable Length
 Alphanumeric
 Nonrepeatable
 The title of the series to which the item being ordered belongs, and the volume or number of the item. The title is separated from the volume and/or number by a slash (/).
 Example: \$VIssuesin American Politics/V.31
- 050 \$W SERIES ISSN/ISBN
 Optional
 Variable Length

Alphanumeric
Nonrepeatable

The ISSN and/or ISBN of the series being ordered. The series ISSN and the series ISBN are separated by a slash (/). If only the ISBN is present it should be preceded by a slash (/). Example: \$W12345678/0123456789

050 \$X

SPECIAL INSTRUCTIONS

Optional
Variable Length
Alphanumeric
Nonrepeatable

A free form subfield allowing the communication of special instructions regarding the 050 field in this purchase order record.

BIBLIOGRAPHY

- Ernest A. Muro and others, "Turnkey Systems for Cataloging and Acquisitions" (Paper presented at First Annual Library Computer Conference, Philadelphia, Penn., 1980).
- Sandra K. Paul, "Computer-to-Computer Communication in the Acquisition Process," *Journal of Library Automation* 14:299-303 (Dec. 1981).
- James K. Long, "Electronic Order Transmission," *Journal of Library Automation* 14:295-97 (Dec. 1981).
- E. Bushinski, "Documentation/Bibliographic Data Elements in Manual and Machine Systems/Documentary Data Elements" (ISO/TC46/SC6/WG1/N71, June 23, 1982, International Organization for Standardization).
- Ernest A. Muro, "Standards and Interfaces," *Information Technology and Libraries* 14:315-17 (Dec. 1982).
- Charles C. Stewart, "Update on Ordering Standards," *Information Technology and Libraries* 14:341-43 (Dec. 1982). ■■



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News and Announcements

Full Text of Magazines and Journals

Information Access Company (IAC) and DIALOG Information Services have announced the development of two full-text, online databases of major magazines. Forty-seven publishers have joined IAC and DIALOG in this online information service, which will be accessible from virtually any computer or terminal. The service offers controlled vocabulary indexing of periodicals.

Created by IAC, the new databases are called *Magazine ASAP* and *Trade & Industry ASAP*. The ASAP files will offer the full text of articles from more than forty major general-interest periodicals and more than eighty business and trade publications online through DIALOG Information Services. In addition, the complete text of news releases from PR Newswire will be available in *Trade & Industry ASAP*. Coverage will date back to January 1983. The databases are cumulative—new issues of each publication will be added shortly after publication and all retrospective material will remain for reference. Users can search the databases for specific topics or names and view the full text of articles at their terminal or request the material by mail.

Initially, forty-seven publishers with more than 130 publications will be represented in the ASAP files. Negotiations are under way with additional publishers, and, as rights are received, their publications will be added.

There is no initial fee or monthly minimum for use of the ASAP databases. DIALOG charges are only for actual online time, plus a flat charge per article. ■■

Harvard Business Review Database Offered through Nexis

John Wiley & Sons has announced that *HBR/Online*, the full-text database of the

Harvard Business Review, will be available through Nexis, the online, full-text information search service of Mead Data Central. Mead also owns and operates Lexis, a computer-assisted information service for the legal profession. Charges for accessing *HBR/Online* are included in Nexis' regular service, which costs \$50 per month, \$30-\$90 per connect hour, plus "search unit" costs.

Other retrieval services through which *HBR/Online* is distributed include DIALOG, BRS, BRS/After Dark, Datastar, and Executive Information Service.

Subscribers to Nexis will gain immediate access to each current issue of the *Harvard Business Review* upon publication, as well as electronic entry to *HBR/Online*'s file of past issues dating back to 1976. *HBR/Online* will also be one of the few publications on the Nexis system to offer abstracts as well as full text.

HBR/Online is the result of a joint venture between John Wiley & Sons and the *Harvard Business Review*. ■■

CLR Awards Forest Press, OCLC \$94,350 for Study of Dewey Classification as Online Tool

The Council on Library Resources has awarded a \$94,350 grant to the Forest Press Division of Lake Placid Education Foundation and the Online Computer Library Center (OCLC) for research into the Dewey classification as an online searcher's tool for subject access, browsing, and display in an online public access catalog.

Forest Press, publishers of the Dewey decimal classification, and OCLC's Office of Research will explore the significance and value of classification in the information retrieval environment of online catalogs. Forest Press is contributing \$55,000 to the project; OCLC is contributing computing facilities and overhead valued at \$137,511 and \$17,385 in funds. With the CLR grant, the total research project is

budgeted at \$304,246. The four-phase project began January 1, 1984, and runs through September 1985.

Principal investigator for the project is OCLC research scientist Karen Markey. According to Markey, the project initially will use expert opinion to arrive at a consensus about selection of Dewey decimal classification (DDC) fields and text for subject access, browsing, and display in an online public access catalog. The second phase will demonstrate the DDC as an online searcher's tool by building the DDC into an experimental online catalog, and the third phase will involve library patrons and staff in a test of the tool's effectiveness. An evaluation of the DDC as a user's tool in an online catalog demonstration and dissemination of results of the project make up the final phase. CLR will host a special working conference, "Classification Online," at the end of the project to help disseminate the project's findings and explore crucial issues for the use of classification in online catalogs. ■■

The Johns Hopkins University Selects BLIS

The Johns Hopkins University has acquired Biblio-Techniques Library & Information System (BLIS) to serve as a public access online library catalog for the Milton S. Eisenhower Library. The Johns Hopkins University is the second major university library to execute a full software license to use BLIS. BLIS will be installed on the University's IBM computer system.

The University of California at San Diego signed for a total BLIS software and hardware system in September 1983. The University of California at San Diego installation is planned for spring 1984.

Columbia University, of New York, is planning to install BLIS software in early 1984 for a six-month demonstration of BLIS. The Columbia University Libraries will evaluate the use of BLIS as an online public access catalog and will contribute to enhancing the design and further development of the BLIS online catalog.

Currently, five major universities are planning to use BLIS or Washington Library Network (WLN) software to implement online library catalogs in 1984. In ad-

dition to the three universities using BLIS, the Universities of Illinois and Missouri are using the software system, licensed directly from WLN, to implement online catalogs. Biblio-Techniques expects to install at least three more systems in 1984.

BLIS operates on IBM or IBM-compatible computer equipment. BLIS is designed to support large databases and single- and multilibrary networks. A BLIS equipment configuration can be upgraded easily and can expand to the limits afforded by the full range of IBM-compatible computer systems. A large number of microcomputers and ASCII CRT terminals can be used to access BLIS.

The WLN software provides indexed access and maintenance for a full MARC database with authority control and acquisitions and accounting functions. Biblio-Techniques will provide an integrated circulation control component in 1985. ■■

DOBIS/LIBIS as Turnkey System

IBM Europe has announced a new version of the integrated library management system DOBIS/LIBIS. DOBIS/LIBIS-SSX has the IBM program number 5785-DLP and runs under the SSX/VSE (Small System Executive/Virtual System Extended) operating system on IBM 4300 machines. It is designed to be used in small and medium-sized libraries.

DOBIS/LIBIS is an integrated online library management system to handle all activities of libraries, document collections, and archives. The following major functions are included:

- Online acquisition of library materials including financial control and follow-up of late orders.
- Online cataloging that includes an extensive character set and KWIC-indexed authority files.
- Online searching of a wide variety of access-point files, with Boolean combinations and limitation by date and circulation status.
- Online circulation control, with barcode labels and assistance in converting the most active part of the collection during circulation so that online operation can begin quickly.
- Online periodicals control for computer-

guided issue check-in and claiming of missing and late issues.

- Networking of libraries with a shared catalog and separate circulation and accounting files.
- Online entry and change of abstracts with abstract words available for online searching.
- Statistical and management information about the library's activities.
- Production of a wide variety of notices and listings whose formats can be specified and changed online.
- Catalog cards and online public access, COM, and printed catalogs.

In addition to these library functions, the following new functions are provided:

Installation

- Installation is claimed to be particularly easy through use of the SSX/VSE Application Interface. All the jobs and procedures are provided to make a running DOBIS/LIBIS-SSX installation.
- Installation steps are described for users without data processing skills in the *Installations and Operations Guide*.
- Sample problems are included to test all major functions.

Tailoring

- Online functions are provided to allow the library to tailor the system to its own environment with its own branches, borrower types, and so forth.
- Specifications are supplied for all printed outputs such as book orders, overdue notices, and acquisitions lists. Library-specific information (library name, address, etc.) can be entered by means of a simple online procedure.
- Two databases are provided, with facilities to switch from one to the other. One, containing example records, can be used for practice and training. The other is the production database.

Operations and Maintenance

- Statistical information can be printed by use of predefined procedures, which can be easily modified to match library requirements.
- Maintenance programs keep the user informed about the status of the database and the need for reorganization and then produce the reorganization jobs.
- The file sizes and parameters for these jobs are calculated automatically.

SSX/VSE (program number 5666-265) is an operating system that has been pre-generated with selected VSE functions. It is fully compatible with DOS/VSE and is pre-configured to support a range of 4300 hardware. Prompters and aids make SSX/VSE easy to install. Special, task-oriented documentation helps with the installation and use of the system.

Documentation includes: *Availability Notice*, GB11-5866; *Librarian's Guide*, SB11-5867; *Installation and Operations Guide*, SB11-5868.

More information about DOBIS/LIBIS-SSX is available from local IBM representatives or from the DOBIS/LIBIS Center, IBM Stuttgart, Vaihinger Strasse 151, 7000 Stuttgart 80, West Germany. ■■

UTLAS and CLSI Enter Joint Marketing Arrangement

UTLAS and C L Systems, Inc. (CLSI), have announced a joint marketing agreement for North America. Under this agreement, CLSI will market UTLAS database products and services in the U.S., while UTLAS will market CLSI local library systems and services in Canada. This agreement brings together two major areas of library automation, i.e., the centralized utility and the local system supplier.

In addition to offering their currently available products, UTLAS and CLSI also plan to develop cooperatively several new products that will facilitate, without duplication of effort, the integration of the centralized and local automation approaches for libraries. ■■

Campus Conference Network Progress Accelerating

Progress is accelerating on the start-up of the Campus Conference Network, SatServ's dedicated network of Earth stations and viewing facilities on university and college campuses.

Surveys of some fifty sites are taking place, with equipment installation expected to begin in early 1984, as weather permits. At present, sixty-two institutions have been invited to affiliate with CCN, with about ten in the application stage.

Meanwhile, SatServ is contracting with those campuses that already have satellite

reception facilities as receive sites for SatServ's video teleconferences.

Affiliates of the network are campuses that will serve as the primary receive sites for CCN in a geographic area. Associates are alternate receive sites in those geographic locations.

SatServ received funding through a \$470,000 stock purchase by Fairchild Industries last October that allowed SatServ to speed up activities to launch the network. Along with the new partnership established by SatServ and Fairchild was a contract which calls for Fairchild to supply C-band steerable Earth stations for the network. ■■

Lexington Public Library Signs with Data Research Associates

Lexington Public Library (LPL) and Data Research Associates (DRA) of St. Louis have signed an agreement whereby DRA will provide an online integrated automated library system for Lexington.

Under the terms of the agreement, DRA will provide circulation control, acquisitions, and database construction and maintenance functions. Serials control and a public access catalog are also included in the ATLAS software package, and DRA and LPL will jointly develop a cable television interface for the automated system that will allow access to bibliographic database information via the library's dedicated cable channel.

The hardware configuration, which is based on Digital Equipment Corporation's VAX-11/750 processor, includes DEC Rainbow microcomputers used as intelligent terminals in various library system locations. The micros will also be utilized for record conversion and as system backup. ■■

National Gallery of Art Videodisc

The *National Gallery of Art* videodisc, produced by Videodisc Publishing and VIDMAX in cooperation with the National Gallery, is aimed at both the large audience of art enthusiasts and the tech-minded laser system purchasers who have been awaiting

more truly interactive programming. This videodisc should satisfy both. The linear program includes the story of the museum's beginnings and development and a comprehensive, richly detailed tour through one of the finest art collections in the world, both narrated by National Gallery Director J. Carter Brown. It is a collection that spans seven centuries—from Byzantine painters through Leonardo da Vinci and Rembrandt to such modern artists as Matisse and Calder whose works are housed in the spectacular new East Building designed by I. M. Pei.

What makes the *National Gallery of Art* videodisc unique, though, is an interactive catalog of 1,645 still frames of paintings, sculptures, drawings, and prints from the collections of our own national art gallery, each followed by a frame of text identifying the artist and work. The National Gallery's curators worked on the selection of the most important objects of art, producing the first catalog of art from a major museum to be made available to the public on videodisc.

During postproduction, a gallery staff member supervised the transfer, color correction, and matting of each and every video frame at Editel New York's state-of-the-art facility. Each painting, sculpture, or drawing is as color accurate and as sharply defined as a conventional photographic slide, but unlike slides, the videodisc will never fade. And, given the timelessness of the subject matter, it will enjoy an almost unlimited shelf life.

The *National Gallery of Art* videodisc is available at the gallery through the gallery's publications service and at most home-video retailers at a price of \$95. ■■

USBE's New Fiche Lists 7,000 Periodicals in Greatest Supply

Library acquisitions and interlibrary loan staff can quickly find out which periodical issues are in greatest supply at Universal Serials & Book Exchange by consulting a new microfiche. The four-fiche list, "USBE's 7,000 Most Available Serial Titles," includes periodicals of which USBE has almost three million issues in stock.

To compile the new fiche USBE's staff removed a third of the titles on the 1981 edition of the list and added six hundred titles.

Bibliographical information includes: main entry/title, imprint, frequency of publication, and ISSN and OCLC numbers.

USBE sent each of its one thousand member libraries a copy of the fiche and will supply them with additional copies at \$10 each. For nonmembers the price is \$25. USBE also fills orders for thirty thousand additional titles, of which fewer issues are in stock.

As a not-for-profit periodicals clearinghouse, USBE supplies original, complete issues, eliminating copyright problems. Members pay only handling fees for the periodicals they receive. ■■

LCS in Illinois

The Illinois Statewide Library Computer System (LCS) recently observed several milestones:

- On December 11, 1983, LCS marked its *fifth anniversary* as an operational system in the state of Illinois. The University Library, University of Illinois at Urbana-

Champaign, began using LCS on December 11, 1978.

- LCS now supports more than five hundred terminals.

- LCS processed 3,407,687 transactions (bibliographic searching, circulation, etc.) during November, establishing a new record for monthly system activity. The November total reflects an increase of 36.83 percent over the system activity levels of November 1982.

The 26,255 interlibrary circulation transactions initiated during November also represent a record. The November figure represents an increase of 45.34 percent over November 1982. More interlibrary circulation activity has been recorded during the first *five* months of fiscal 1984 than in the first *seven* months of fiscal 1983.

LCS, maintained by the University of Illinois Office of Administrative Information Systems and Services, provides twenty-three academic libraries in the state of Illinois with both local and interlibrary known-item searching and circulation capabilities. ■■

INDEX OF ADVERTISERS

Baker & Taylor	page 183
Blackwell North America Inc.	2d cover
Book House	page 223
Carrollton Press	page 108
CLASS	page 207
Data Phase	pages 172-73, 3d cover
EBSCO	page 214
EMS	page 130
Faxon	page 224
General Research Corp.	4th cover
Integrated Online Library Systems	page 107
JERA	page 219
Midwest	page 177
OCLC	page 201
SIRSI Corp.	page 208
System House	page 195
UMI	pages 164-65
Universal Library Systems	page 175

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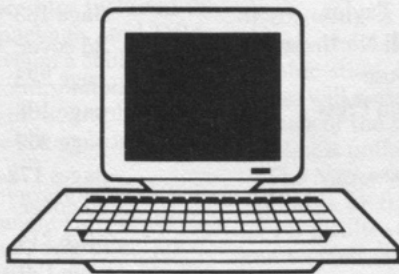
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Recent Publications

Bibliographic citations were produced with the guidance of Maria Clark, Yale University Library, New Haven, Connecticut, in accordance with the American National Standards for Bibliographic References. New York: American National Standards Institute, 1977. 92p. (American National Standards on Library Work and Documentation; ANSI Z39.29-1977).

Reviews

Buckland, Michael K. *Library services in theory and context.* New York: Pergamon Press; 1983. xii, 203p. ISBN: 0-08-030134-7, hardcover, \$25; 0-08-030133-9, softcover, \$9.95.

Michael Buckland, dean of the School of Library and Information Science at the University of California, Berkeley, has attempted a massive task within a relatively narrow compass. His intention is to formulate an initial, though giant, step toward the development of a philosophical framework for the understanding of library services. Large questions are asked, and answers, some tentative, are proposed for most of them. This is by no means the mind-grinding tome its title and intent might suggest, but more in the line of what the late Lord Glenavy called "a short trot with a cultured mind." There is no doubt that Buckland possesses the informed and inquiring mind necessary for such a trip, or that the result is as stimulating to the mind as a jog around Berkeley's leafy lanes is to the body. Few topics touched upon by Buckland are without possibilities of contention (personally, I found his discussions of "information science" and "librarianship" far too favorably disposed toward the informaniac school of thought), but the notions put forward are always challenging and the conclusions always conducive to thought. On occasion, the short trot becomes more of a breathless canter. I believe

that many with a special interest will think that their pet topic has been treated cursorily, but that is a risk run by all comprehensive endeavors such as Buckland's.

The book opens with some fundamental questions. These are concerned with the nature of librarianship and with some problems of librarianship that the author ascribes to the lack of an adequate theory. His discussion of the nature of librarianship takes him into such matters as the imagery of the topic, the overlap (some say the synonymy) of libraries as institutions and librarianship as a profession and science, the nature of schools of librarianship, and the systemic nature of the relationship between libraries, library users, and library services. All of this preliminary matter is dedicated to the possibility of the construction of a theory of librarianship—without such a theory, of course, librarianship can scarcely lay claim to being a science.

He follows this with an analysis of librarianship based on five broad categories. The first is that of the inquiries with which libraries deal. Here I stumble over his use of "information" in a sense that is so broad as to be, to me, virtually meaningless. If information encompasses facts, knowledge, culture, aesthetics, music, and who knows what all, then what word do we use for what we common folk call information? This terminological problem colors his discussion of inquiries and, in my view, lessens it. The second category is that of retrieval. Here we are on more solid ground, and Buckland's analysis, though necessarily brief, is more penetrating. For example, his assertion that the study of retrieval systems is a form of linguistic study is both suggestive and illuminating. His third category is that of "becoming informed"—the use of documents and data retrieved. This includes the barriers to the full use of the products of retrieval systems. The fourth category is that of demands made on library services and the means by which they

are satisfied. This includes discussions of the economic basis for libraries and the paradoxes inherent therein. The fifth category analyzed is that of the provision of library services in terms of financial and other resources, and of political and societal questions. Each of these five categories is defined and analyzed. Though the analysis and conclusions are often abstract, there is always an understanding of the realities and practicalities of libraries today.

The last major section of the book attempts a synthesis of the previously analyzed problems and processes and essentially poses the challenging question: Do the parts of librarianship add up to a system for which a theory can be adumbrated? Measurement and evaluation of library services are discussed, as are bibliometrics and the role of information in society. The book ends with an examination of basic problems in the light of the preceding analysis/synthesis.

Parts of this book have appeared in earlier forms elsewhere. It appears that Buckland is pulling together the strands of his previous work to achieve the outlines of a generalized theory. He succeeds to the extent that the reader is forced to think about the larger questions and to view them in an often different light. In the fragmented world of modern librarianship such an integrationist and progressive endeavor must be applauded.

The index to this book is exiguous and unreliable.—*Michael Gorman, University of Illinois at Urbana-Champaign Library.* ■■

Fayen, Emily Gallup. *The online catalog: improving public access to library materials.* White Plains, N.Y.: Knowledge Industry; 1983. 148p. (Professional librarian series). ISBN: 0-86729-054-4, hardcover, \$34.50; 0-86729-053-6, softcover, \$27.50.

With online catalogs fast becoming the topic of the eighties, one is almost tempted to exclaim "What, *again?*" when confronted with yet another book on this seemingly already overdone topic. Emily Gallup Fayen's *Online Catalog: Improving Public Access to Library Materials* is a re-

freshing surprise. Unfortunately, the book would be more aptly titled *The Online Catalog: A Primer*. In any event, this work is mandatory reading for anyone wishing basic information on library online catalogs—what they are; how they work; what systems are currently available; and how to plan and prepare for one. Written in simple, easy-to-understand language, the book provides a comprehensive introduction to the online catalog. One needs no background whatsoever to find this a useful resource.

The early chapters are designed to inform the uninformed. Beginning with a brief discussion of the historical development of online catalogs, Fayen proceeds through an explanation of the theoretical concepts of online data retrieval, followed by a thorough definition of what an online catalog should be. Included is an enumeration of the differences between online and conventional catalogs, as well as an explanation of postcoordinated retrieval and the importance of Boolean operations and keyword access as necessary characteristics of a truly online catalog.

Following this invaluable background material, Fayen has included a chapter on determining the need for an online catalog, in which she explains the variety of catalogs available. Examining the needs of the catalog users and evaluating a library's particular circumstances are considered first priority. She includes a cursory discussion of database building and catalog design.

Moving from the theoretical to the practical, a discussion of available hardware and catalog software provides a listing of vendors supplying catalogs both as enhancements to automated circulation and as components of integrated library systems, together with characteristics of each type. Included is advice on selection of software ("The library can increase its chances of choosing wisely by understanding its requirements"), determining the needed number of terminals ("Probably the correct answer is 'as many as you can afford'"), and other telecommunications considerations. The author concludes with a brief list of dos and don'ts for staff and patron training.

The second section of the book covers

costs, contracts, grants, and funding. Fayen includes a comparison of start-up and maintenance costs for card catalogs, book catalogs, and microform catalogs. She then enumerates expected start-up costs for hardware, software, telecommunications, and other miscellaneous categories, and follows with a summary of continuing maintenance costs. The section concludes with a detailed discussion of what must be included in a turnkey system contract. Available funding support, including suggestions for writing successful grant proposals, is included.

In the final section, Fayen discusses choosing an online catalog. She includes descriptions of representative systems available as of mid-1983. Included are both commercial and institutional vendors. Most descriptions contain a brief discussion of how the specific system operates, necessary hardware, and approximate costs. This section also includes a summary of the CLR national study of user responses to public online catalogs conducted in 1982. The book concludes with an explanation of integrated library systems, including problems and considerations of other library applications to be automated, such as acquisitions, serials control, and circulation.

Fayen has included appendixes containing case studies of three successful online catalog projects and one unsuccessful project, the user and nonuser questionnaires used in the 1982 CLR study, and addresses of selected online catalog installations and system vendors. A glossary of commonly used computer terminology and a selected bibliography of further readings are also provided.

The Online Catalog: Improving Public Access to Library Materials should be considered required reading by anyone needing to know the basics of planning for the installation of a public online catalog. It belongs in every library as an information resource.—Sandra K. Ready, *Mankato State University Library, Mankato, Minnesota*. ■■

Walton, Robert A. *Microcomputers: a planning and implementation guide for librarians and information professionals*. Phoe-

nix, Ariz.: Oryx Press; 1983. 96p. ISBN: 0-89774-097-1, softcover, \$18.50.

Keren, Carl; Perlmutter, Linda, eds. *The application of mini- and micro-computers in information, documentation and libraries: proceedings of the International Conference on the Application of Mini- and Micro-Computers in Information, Documentation, and Libraries, Tel-Aviv, Israel, March 13-18, 1983*. Amsterdam; New York: North-Holland; 1983. 801p. (Contemporary topics in information transfer; 3). ISBN: 0-444-86767-8, hardcover, \$85.

The professional press of electronic data processing, notably *Computerworld* and *Datamation*, has recently run numerous articles concerning the proliferation of microcomputers. Data-processing managers and those responsible for the integrity and currency of large-scale databases are worried that the microcomputers in offices and on desks in their organizations, but outside of the data-processing department, are being used to generate and store information that is not adequately secured and not readily available to others who may need it. One senses a growing recognition on the part of these data-processing professionals that microcomputers are popular in large organizations because they can deliver services that the mainframe system can not and because they can be more easily tailored to the idiosyncrasies of a given application than can a centralized system. This recognition has led to attempts to link the microcomputers to the larger system or to link them to each other in local area networks.

A similar trend can be seen in libraries. Certainly, microcomputers are being purchased by small libraries, as they are by small businesses, to provide the only available computing support. However, there is also a trend to use microcomputers where an available mainframe, or even an available minicomputer, is cumbersome to use or where the computer center can not or will not provide support for a new application. It might be said that the most important factor in the proliferation of microcomputers in libraries is that libraries are gaining increased local control over their own investment. Microcomputers, as with most minicomputer systems, are housed in

the library and operated by library staff. Most minicomputers, however, are turn-key systems with proprietary software, while microcomputers and the software that runs on them are usually acquired separately. To use microcomputers effectively requires somewhat different skills from those required by previous automation efforts, when data-processing staff programmed and ran the machine. Libraries embarking on an automation effort using a microcomputer need to be able to identify, evaluate, and implement the best match of machine and applications software for their purpose. While the investment in time and dollars may be less, the personal stake in the microcomputer is greater, with no one outside the library to share in the work, the credit, or the blame.

Robert A. Walton's book *Microcomputers: A Planning and Implementation Guide for Librarians and Information Professionals* attempts to equip a "reasonably intelligent" novice with the basic understanding necessary to select hardware and software. The book is divided into three parts: "Microcomputer Hardware," "Microcomputer Software," and "Procurement and Management of the Microcomputer System." There are two appendixes: one listing sources of additional information and one listing microcomputer journals. The aim throughout is to remove some of the mystery about microcomputers without going into needless detail, and at this Walton is successful. In addition to librarians, library staff would find this book useful when facing a transition to microcomputers in their jobs. The straightforward explanations of hardware and software and the practical presentation of microcomputers as machines that can alleviate drudgery when used correctly could help replace computerphobia with the enlightened, albeit guarded, enthusiasm necessary for any automation project to succeed.

The only flaws in Walton's book are those resulting from the accelerated developments that occur with microcomputers when compared with the time it takes a book to be published and reach the hands of the reader. For example, Walton considers the question of whether a library should ac-

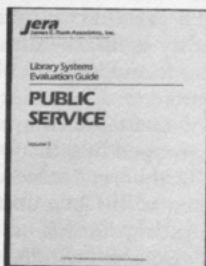
quire an 8-bit or a 16-bit machine, whereas recent developments, such as Apple's new Macintosh and the rumors of a microcomputer from AT&T, suggest that the choice may soon be between 16-bit and 32-bit. Still, this is not Walton's fault nor will it detract from the book in the near future. The book can therefore be readily recommended for all libraries and library staff who are considering the use of a microcomputer.

Walton's book is a thin, red, ninety-six-page introduction to the subject of microcomputers. In contrast, *The Applications of Mini- and Micro-Computers to Information, Documentation and Libraries*, weighing in at 801 pages, looks like one of those intimidating dark blue technical books one finds on the shelves of engineering libraries. The third volume in Elsevier North-Holland's series *Contemporary Topics in Information Transfer* (the previous two volumes were reviewed in the December 1983 issue), this work consists of more than eighty papers delivered at a conference held in Tel Aviv during six days in March 1983. The book is printed in typescript, or what publishers call cold type. As the editors explain in their preface, prompt publication was the overriding concern in preparing this work and the papers were pasted up as they were received from the authors. While the resulting variety of typefaces may not be pleasing to the eye, the editors did achieve their goal of prompt publication, and, given the mercurial nature of the topic and the number of papers, they are to be commended.

Some of the papers deal with minicomputers, some with microcomputers, but the emphasis throughout is on locally operated and locally controlled machines, either as independent systems or as local processors linked to a larger system. Authors from the host country of Israel and from the United States are responsible for about half of the papers each, while authors from the United Kingdom and West Germany contribute another quarter. The remaining papers are from Canada (seven papers), France (four papers), Italy, South Africa, Brazil, Chile, Mexico, Holland, Sweden, Hong Kong, and Japan. The twenty or so papers from

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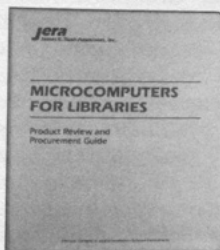


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Israeli authors may comprise the best available work on library automation in Israel.

To say that the papers are uneven in quality would be an understatement, but there is much that is of value to readers interested in the variety of applications of mini- and microcomputers. The papers can be grouped into the following categories:

Hardware, including strong papers by Ching-chih Chen on microcomputers and by Audrey Grosch on minicomputers.

Software, including papers on the problems of developing or obtaining systems and applications software. The best of these is a paper by A. E. Kent, whose premise is that microcomputers are well suited to small, idiosyncratic information problems that require simple but flexible software. He proposes an erector-set approach with modules that can be assembled by nonprogrammers to meet specific applications.

Special topics. Three sections of five or six papers each are presented on the importance of mini- and microcomputers to (1) man-machine interaction, (2) networking, and (3) numerical and factual information retrieval.

Specific applications. The bulk of the papers describe actual systems that exist or that are under development. These papers are grouped by application and include descriptions of systems used in agriculture libraries, library management, education, library and information science education, online searching, and technical processing.

Keynote papers. Several keynote addresses were delivered at the conference and they are reprinted here, including Gerard Salton on the characteristics of information systems of the future, F. W. Lancaster proposing that today's microcomputers are part of the "infrastructure" of the paperless society, Manfred Kochen warning that microcomputers will increase the amount of information and that we need intelligent systems to map the structures of information, and Wolfgang Dietrich Rauch on the changes in the information environment caused by smaller scale computers. The most intriguing keynote address is by the late Derek deSolla Price, to whose memory this book is dedicated. His paper attempts to place computers in the

context of the history of communications and suggests, as does Kochen, that computers should be able to organize and structure information for us and provide us with "road maps" to navigate and discover what we need.

At eighty-five dollars the price of the book works out to a dime per page of cold type, as strong an argument for the paperless society as this reviewer has seen. These papers present a good overview of the present use of smaller computers in libraries, and there is much that is of current value to those interested in the topic. Conference proceedings too often publish papers much as they were presented. Presented papers are intended for a live audience and the best will introduce and illuminate only a few points because the live audience simply cannot absorb much beyond that. (As a wise man once said, the mind can only absorb what the seat can endure.) Published papers can and should provide a greater substance, and it is questionable whether the substance offered by this work justifies the high price. Thus, this book can only be recommended for the most comprehensive collections in library and information science.—*William Gray Potter, University of Illinois at Urbana-Champaign.* ■■

Whiffin, Jean. *Union catalogues of serials: guidelines for creation and maintenance, with recommended standards for bibliographic and holdings control.* New York: Haworth Press; 1983. xi, 138p. (Serials librarian; v.8, no.1). ISBN: 0-86656-238-9, hardcover, \$14.95.

Whiffin calls her book *Union Catalogues of Serials*, as opposed to *Union Lists of Serials*, because, she contends, the term *list* "is becoming obsolete in an automated environment," and because the lists of the past have often "contained inadequate bibliographic detail to perform even the basic functions." In this work, she proposes specifications for the creation and maintenance of union catalogs of serials, with special emphasis on the minimum standards required for bibliographic and holdings control.

This study is actually the draft interna-

tional standard that Whiffin prepared in her role as a consultant on union catalogs of serials to IFLA and UNESCO. The final guidelines were published by those organizations in December 1981 under the title *Guidelines for the Compilation of Union Catalogues of Serials* (document PGI-83/WS/1, available from UNESCO, 7 Place de Fontenoy, 75700 Paris, France).

While the final document presents valuable guidance for the compilation of union catalogs, it is far less comprehensive and controversial than the original draft. For example, Whiffin's nineteen pages of recommended standards for bibliographic and holdings control are reduced to two pages in the official document. Haworth Press has provided a real service with the publication of the draft, which otherwise would not have been available to the general library community.

Following a general introduction written for the Haworth publication, the draft guidelines are published as originally submitted to IFLA. They cover the functions, scope, and formats of union catalogs of serials, methods of compilation, the responsibilities of participants, and recommended standards for style, presentation, and arrangement. While useful suggestions are contained throughout the work, the most timely chapters are those defining minimum reporting standards for bibliographic and holdings control, including a chapter covering special categories such as newspapers and government publications. Librarians currently working on standards for minimal-level cataloging and summary-level holdings displays, whether on a national level or within their own institutions, will be interested in Whiffin's suggestions. In the case of bibliographic notes, for example, she recommends that three types be included: linking entries, numbering irregularities, and microform/reprint information. For holdings statements, notes are limited to those that specify polarity of microforms and those that clarify the edition held. In general, Whiffin's recommendations are compatible with AACR2 and ANSI standards, but few union catalogs currently conform to those national codes.

Most of the limitations of the study stem

from the fact that it was the first draft of the guidelines, rather than a documented analysis. Although Whiffin examined more than two hundred union catalogs before preparing the report, no attempt was made to detail the findings of her extensive study, or to support her recommendations with specific examples. In general the ideas are sound and logical, but occasionally a radical idea is introduced without further elaboration. For example, paragraph 6.5.4. states: "Display of history and holdings under latest title or earliest title, as well as successive, through machine linkages of segments and special programming . . . should be considered a standard display feature in on-line systems." The display of the entire history of a serial on each successive entry record is certainly not standard practice today, and some explanation and/or examples are undoubtedly needed here.

A lack of editing is also evident in the organization of the book, particularly with the illogical placement of suggestions for designing microfiche and online systems in the chapter called "Criteria for Special Categories," as opposed to inclusion in the section on "Recommended Standards for Style, Presentation, and Arrangement."

Whiffin states that her goal is "to present the practical optimum for design, compilation and maintenance of union catalogues." Librarians with limited resources, especially those in developing countries (a target audience of the framers of the project), will find the emphasis is placed on *optimum* rather than *practical*, since many recommendations presuppose the availability of funding for a state-of-the-art online system.

Despite the aforementioned flaws, this publication will prove useful to the library community. Librarians developing new union catalogs or planning to automate existing ones will find it replete with valuable suggestions. One caveat is in order. This book was also published as V.8, no.1 (Fall 1983) of the journal *Serials Librarian*. Libraries that receive that journal are unlikely to need an additional copy in the form of a bound monograph.—Crystal Graham, *New York University, New York, New York.* ■■

Other Recent Receipts

Listed here are books and other publications of potential interest to members of LITA, received for review. Some of these materials may be reviewed in later issues of ITAL.

Boehm, Eric H.; Buckland, Michael K., eds. *Education for information management: directions for the future*. "Report of a conference co-sponsored by the Information Institute, International Academy at Santa Barbara and the Association of American Library Schools, May 6-8, 1982." Santa Barbara: International Academy at Santa Barbara; 1983. 125p. ISBN: 0-9610590-0-1, softcover, \$24.50 to institutions and \$18.38 to individuals.

Borgman, Christine L. *End user behavior on the Ohio State University Libraries' online catalog: a computer monitoring study*. Dublin, Ohio: OCLC; Aug. 31, 1983; OCLC/OPR/RR-83/7. 30p. (Research report series). Softcover, \$3.

Bunn, Paul. *Games for your Atari computer*. New York: Dell; 1983. 128p. (Dell computer games series). First published in Great Britain. ISBN: 0-440-52800-3, spiral-bound, \$5.95 in U.S. and \$7.50 in Canada.

Carlson, David; Morein, P. Grady, comps. *Online bibliographic database searching in college libraries*. Chicago: College Library Information Packet Committee, College Libraries Section, Association of College and Research Libraries; 1983. "Results of a survey which went to 252 library directors." 132p. (CLIP note 4-83). ISBN: 0-8389-6624-1, spiral-bound, \$15 to ACRL members and \$19 to nonmembers. Available from: Association of College and Research Libraries/ALA, Chicago.

Charlton, Mark. *Games for your Timex-Sinclair 1000*. New York: Dell; 1983. 128p. (Dell computer games series). First published in Great Britain as *Games for your ZX81*. ISBN: 0-440-52785-6, spiral-bound, \$5.95 in U.S. and \$7.50 in Canada.

Cibbarelli & Associates. *IBM Displaywriter database design (REPORTPACK)*. Studio City, Calif.: Cibbarelli & Associates; 1983. "Guide to the creation and maintenance of specialized databases on the IBM Displaywriter." 35p. (Consulting report series). ISBN: 0-913203-04-1, softcover, \$25 in U.S. and \$30 foreign.

Cosentino, John, ed. *Computer graphics marketplace 1983-84*. Phoenix, Ariz.: Oryx Pr.; 1983. Directory of manufacturers, consultants and services, professional organizations, educational programs, conferences and conventions, and publications. 102p. ISSN: 0278-2774. ISBN: 0-89774-086-6, softcover, \$32.50.

Dowlin, Kenneth E. *The electronic library:*

the promise and the process. New York: Neal-Schuman; 1984. 199p. (Applications in information management and technology series). ISBN: 0-918212-75-8, softcover, \$24.95.

Fox, Christopher John. *Information and misinformation: an investigation of the notions of information, misinformation, informing, and misinforming*. Westport, Conn.; London: Greenwood; 1983. 223p. (Contributions in librarianship and information science; 45). ISBN: 0-313-23928-2, hardcover, \$29.95.

Gratton, Peter D. *Automation in Derbyshire County libraries*. London: Library Assn.; 1983. 110p. (Case studies in library automation). ISBN: 0-85365-984-2, softcover \$20. Available from: Oryx Press, 2214 North Central at Encanto, Phoenix, AZ 85004.

Hawes, D. F. W.; Botten, D. A. *Library automation at the Polytechnic of the South Bank*. London: Library Assn.; 1983. 132p. (Case studies in library automation). ISBN: 0-85365-944-3, softcover, \$24. Available from: Oryx Press, 2214 North Central at Encanto, Phoenix, AZ 85004.

Hubbard, Stuart W. *The computer graphics glossary*. Phoenix, Ariz.: Oryx Pr.; 1983. 95p. ISBN: 0-89774-072-6, hardcover, \$24.50.

Information Systems Consultants, Inc. *Document delivery in the United States: a report to the Council on Library Resources*. Washington, D.C.; Dec. 1983. 78p. Softcover, \$5. Available from: CLR, 1785 Massachusetts Ave., NW, Washington, DC 20036.

Kibirige, Harry M. *The information dilemma: a critical analysis of information pricing and the fees controversy*. Westport, Conn.; London: Greenwood; 1983. 195p. (New directions in librarianship; 4). ISBN: 0-313-23381-0, hardcover, \$29.95.

McClintock, Marsha Hamilton, comp. *Training users of online public access catalogs: report of a conference sponsored by Trinity University and the Council on Library Resources, San Antonio, Texas, January 12-14, 1983*. Washington, D.C.: Council on Library Resources; July 1983. 122p. Softcover, \$10.

McKee, Gerald. *Directory of spoken-word audio cassettes*. New York; Guilford, Conn.; London: Jeffrey Norton Publishers; 1983. "Lists the offerings of nearly 700 producers of spoken-voice audio-cassette programming in the educational, motivational, inspirational, and entertainment realms. . . aimed at the adult or college-level listeners." 165p. ISBN: 0-88432-118-5, softcover, \$24.50.

Mason, Marilyn Gell. *The federal role in library and information services*. New York; London: Knowledge Industry Publications; 1983. 177p. (Professional librarian series). ISBN: 0-86729-010-2, hardcover, \$34.50; 0-86729-009-9, softcover, \$27.50.

Nolan, Jeanne M. *Micro software report: li-*

brary edition, volume II—July 1982–July 1983. 2d ed. Torrance, Calif.: Nolan Information Management Services; 1983. "Intended to serve as a tool for those looking for a comprehensive listing of library and information management microcomputer software." 157p. Softcover, \$49.95. Available from: NIMS, 21203A Hawthorne Blvd., Suite 5323, Torrance, CA 90509.

National Library of Canada. Task Group on Computer/Communication Protocols for Bibliographic Data Interchange. *Interim report presented to the National Librarian of Canada*. Ottawa: National Library of Canada; Oct. 1983. 18, 20p. (Canadian network papers; 6). Text in English and French. ISSN: 0226-8760. ISBN: 0-662-52648-1, softcover.

Online database search services directory. 1st ed. Part 1 of 2 parts, Dec. 1983. 572p. "Provides detailed descriptions of the online retrieval services offered by public, academic, and special libraries, private information firms, and other organizations in the United States and Canada." Detroit: Gale. ISBN: 0-8103-1698-6. ISSN: 0741-0077. Subscription to the two parts: \$75 (part 2 to be ready Aug. 1984).

Online terminal/microcomputer guide & directory: 1983 supplement. Weston, Conn.: Online, Inc.; 1983. 99p. ISSN: 0734-5100, softcover, \$30.

Post, William E.; Watson, Peter G., eds. *Online catalog, the inside story: a planning and im-*

plementation guide. Chico, Calif.: Ryan Research International; 1983. 158p. ISBN: 0-942158-02-4, softcover.

Resource sharing and information networks. 1 (1/2): Fall/Winter 1983. New York: Haworth Pr. ISSN: 0737-7797. "Successor title to *Resource sharing and library networks*." Annual subscriptions in U.S.: \$33 to individuals and \$60 to institutions.

Shaw, Peter. *Games for your Timex-Sinclair 2000*. New York: Dell; 1983. 124p. (Dell computer games series). First published in Great Britain as *Games for your ZX Spectrum*. ISBN: 0-440-52794-5, spiral-bound, \$5.95 in U.S. and \$7.50 in Canada.

The video source book. 5th ed., "professional volume." Syosset, N.Y.: National Video Clearinghouse; 1983. 1,546p. "Features more than 35,000 programs currently available on video from more than 700 sources." ISBN: 0-935478-21-3, hardcover, \$125. Dist. to libraries in the U.S. and Canada by Gale, Detroit.

The video tape and disc guide to home entertainment. 4th ed. Syosset, N.Y.: National Video Clearinghouse; 1983. 444p. "Over 4,000 listings of the most popular movies and programs available for home use." ISBN: 0-935478-22-1, softcover, \$9.95.

Widing, Robert E., II; Talarzyk, W. Wayne. *Videotex project reviews II*. Dublin, Ohio: OCLC; Oct. 28, 1983; OCLC/OPR/RR-83/8. 107p. (Research report series). Softcover, \$6. ■■

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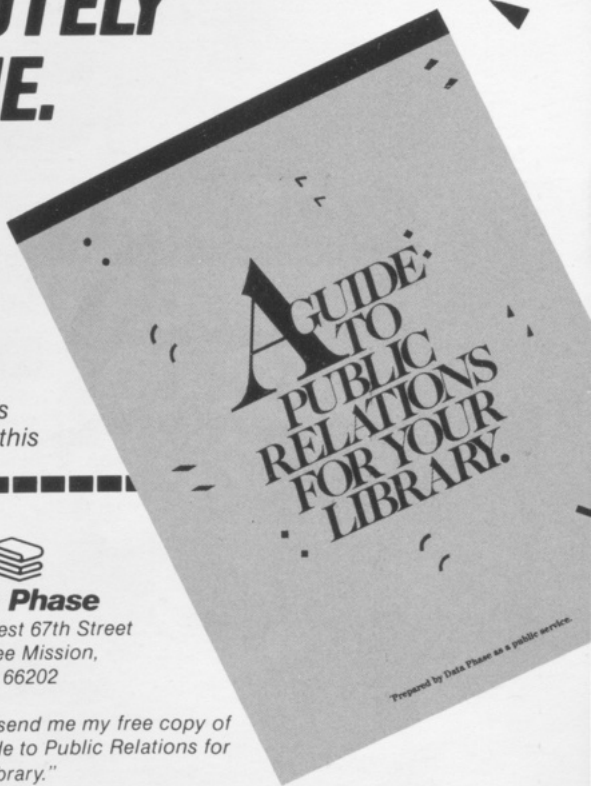
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