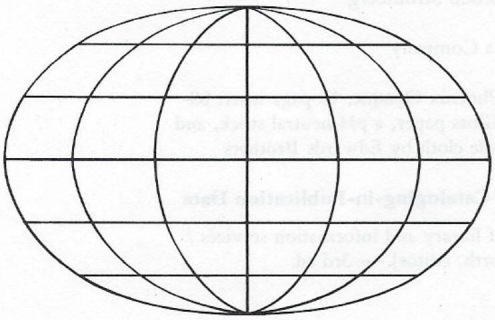
WORLD ENCYCLOPEDIA
of Library and Information Services

Third Edition



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school libraries. Until 1970 the Department of School Libraries in the Ministry of Education also operated a centralized acquisition and book-processing center that selected, purchased, and distributed books for all the school libraries in the country. Each library thereafter purchased its own books, but most of these were chosen from the selection tools prepared by the Department. Therefore, there is a kind of similarity between collections in all school libraries of the same level not only in the quality of books but also in the quantity. In many instances the collections do not correspond with the needs of pupils or teachers. School library services are traditional: they are restricted to lending books. Collections comprise only books and a few local newspapers and magazines. In 1961 the concept of school-community libraries was introduced in Egypt, and they provide services to the general public as well as to the students.

There are more than 4,500 school libraries, with holdings of approximately 8,150,000 volumes. These estimates, provided by the government, include all schools that have even a handful of books. The actual number of school libraries is closer to 1,000, and they serve only about 14 percent of the population.

Special Libraries. Egypt entered the 1990s with 7 information centers and 380 special libraries, most of them in ministries and other governmental agencies and smaller numbers in learned societies and in institutions and corporations. The special library in Egypt corresponds in collections and size with the needs of the institution it serves. The size of the collections depends entirely upon the history of the institution and the available budget. Governmental libraries contain government documents, laws, archives, and foreign materials not easily available elsewhere. In many instances services are limited to lending materials only to those who work in the institution. Information centers were established to serve researchers and scientists in government and semigovernment organizations. They are considered special libraries, although they are superior to most special libraries in the country. They go beyond traditional services and provide new kinds of services that represent modern thinking in special librarianship and information services. Among the services these centers provide are indexing and abstracting, translation, bibliographic activities, and current awareness services; some provide computerized information storage and retrieval. Information centers are recognized at the Institute of Public Administration, Iron and Steel Company, Atomic Energy Establishment, National Information and Documentation Center (NIDOC), Education Documentation and Research Center of the Ministry of Education, National Planning Institute, and Ministry of National Planning. Each special library or information center varies. A library may have as few as four staff members, or it may have a staff of a hundred. Some libraries or centers concentrate their holdings on books, others on periodicals or documents. They may have from 3,000 to 180,000 volumes in their collections.

The Profession. The Egyptian Library and Archives Association (ELAA), established in 1946 as the Cairo Library Association, works toward improvement of professional standards of librarianship. Other activities include the development of library collections and increased publication of Arabic library literature. The Association is affiliated with IFLA.

MOHAMMED M. AMAN;
SHA'BĀN KHALIFA

Electronic Data Sources

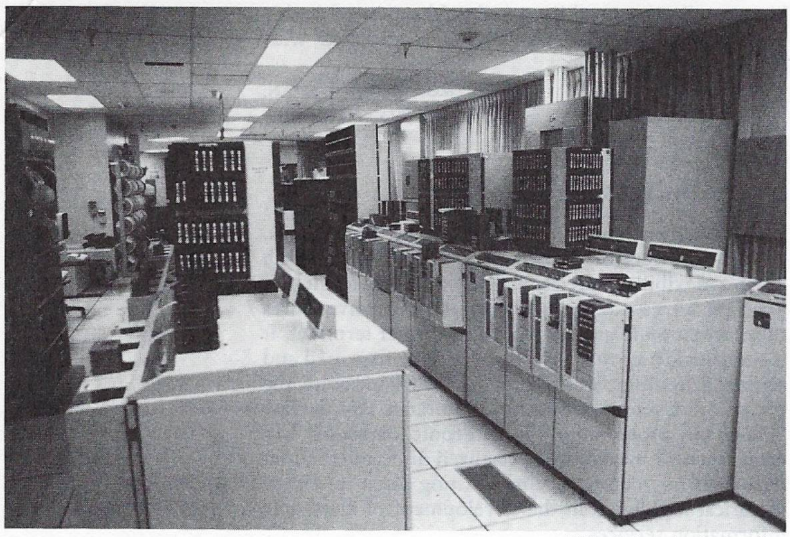
Electronic data sources, like general reference sources, provide answers or references to answers, but with greater flexibility, precision, and speed than similar print resources can. They open comprehensive stores of information to anyone with a computer terminal. It is no coincidence that such sources were first used and nurtured by libraries and are still associated with the provision of reference services in libraries. By the late 1980s, the proliferation of electronic databases had created a new market for specialized directories. What follows is not a comprehensive listing but a review of historical highlights in the development of electronic information services.

HISTORY

Electronic data sources for libraries were developed as a means to facilitate the search of bibliographic citations. In "Online Systems: History, Technology, and Economics," in the *Journal of the American Society for Information Science* (May 1980), Charles Bourne observed that "an investigation of online bibliographic searching was first made by Bagley in 1951" with the development of a program for a computer at the Massachusetts Institute of Technology "to search encoded abstracts." Bourne noted that "application of the computer to bibliographic searching was first demonstrated in 1954 in the form of batch searching."

Over the next 10 years, many research and development efforts culminated in the development of "batch" searches of bibliographic databases offered by a limited number of special libraries. Search analysts coded requests sent to them for literature searches. Several searches were then batched, or run consecutively, to make the most efficient use of the computer's time. Several weeks generally passed before the requestor received any result. One batch retrospective search service, the Medical Literature Analysis and Retrieval System (MEDLARS) of the National Library of Medicine (NLM), was made available to the general public in 1964.

Several years and a complete generation of computing ability would pass before the powerful systems that people can immediately interact with were introduced. Subsequent developments enabled users to search databases on CD-ROM (compact disc read-only memory disks) at their own workstations or microcomputers. Through the use of CD-ROM "jukeboxes," libraries can provide remote access over a network to a large number of databases. Another alternative becoming more popular in the 1990s is to tape-load commercial bibliographic databases into the library's online catalog. With some products and systems, the user is able to switch directly between the citation of an article to information on the availability of the article in the user's library. By the early 1990s, libraries were experimenting with systems that further allow the user to order an electronic or paper copy of



Dialog Information Services, Inc.

Section of the Dialog computer room showing cassette tape drives used for database updates.

the full article. Librarians in developed countries are increasingly called upon to help users navigate through a confusing array of local databases, CD-ROMs, online services, and networked electronic bulletin boards and file servers.

SDC Information Services. Systems Development Corporation (SDC) demonstrated the first interactive online system, Protosynthex, developed by Robert Simons and John Olney, in 1960. Using a terminal wired directly to the computer, Protosynthex allowed access to the full text of the *Golden Book Encyclopedia* with the ability to search for the occurrence of terms in proximity with each other and to search for truncated forms of words, but not to combine terms with the use of Boolean logic.

Another online retrieval system was developed at SDC in late 1964 by Harold Borko, H. P. Burnaugh, and W. H. Moore. The system, Bibliographic Organization for Library Display (BOLD), was developed for browsing literature citations on magnetic tapes. It was first publicly demonstrated about a year later and was one of the first systems capable of displaying an online thesaurus. In November 1964 SDC first demonstrated an online system that nearly achieved the interactive capability today's users enjoy, Language Used to Communicate Information System Design (LUCID), developed for SDC by E. Franks and P. A. DeSimone.

"The first demonstration of an online retrieval network, on a national scale," according to Bourne, "was probably made in 1965 by SDC in an experiment . . . to provide 13 organizations with access to some 200,000 bibliographic records on foreign technology." This work was done by SDC-Dayton for the Foreign Technology Division of Wright-Patterson Air Force Base, Ohio.

SDC was instrumental in the development of NLM's online information service, MEDLINE (MEDLARS ON-LINE). In late 1967 NLM experimented with SDC's Online Retrieval of Bibliographic Information Timeshared (ORBIT) retrieval language to search NLM's database of 10,000 citations on neurology. In May 1970 SDC began operating the Abridged Index Medicus (AIM)/TWX online information system on behalf of NLM. In October 1970 NLM introduced MEDLINE as a free service on its own computer facilities with a database of more than 400,000 citations while allowing the AIM/TWX service to continue with SDC. In February 1972 NLM utilized TYMNET, the first public telecommunication network, for access to MEDLINE.

NLM introduced a modified version of ORBIT for the ELHILL retrieval language used in MEDLINE; the H. W. Wilson Company also adopted a version of ORBIT for the retrieval language used in its WILSONLINE service, inaugurated in 1984.

SDC Search Services was made commercially available in December 1972 as an online information service using the ORBIT retrieval language, Carlos A. Cuadra serving as its manager for several years. The service, later named SDC Information Services, offered more than 60 databases in the late 1980s with strengths in petroleum, energy, patents, chemistry, and science and technology.

DIALOG Information Services. Roger K. Summit of Lockheed Missiles and Space Corporation first demonstrated the ability to search an in-house database of the Lockheed library catalogue file in 1961. Summit designed the DIALOG language in 1962 at the Lockheed Information Sciences Laboratory in Palo Alto, California, while "working on only the third IBM 360 produced," according to Marjorie Hlava in an article "The NASA Information System":

> In 1964, after some discussion with Mel Day of NASA, Summit prepared a proposal to NASA to use DIALOG for the automation of the NASA information system. NASA responded by issuing a Request for Proposal to develop a NASA/RECON prototype. Lockheed and several other companies bid the proposal.

Although it lost the first bid, in July 1966, Lockheed won a contract to demonstrate an online system for searching and retrieving more than 300,000 bibliographic citations of NASA, an effort that utilized the DIALOG retrieval language. Lockheed began providing a regular online search service to the NASA Ames Laboratory in November 1966 and later to other NASA facilities. "By 1970," Bourne notes, "a version of the DIALOG system was being operated by NASA, the system serving 24 terminals in NASA facilities across the country from a file that had grown to 700,000 records." NASA's Remote Console Information Retrieval Service (RECON) was installed at its Scientific and Technical Information Facility in Maryland to serve all major NASA research centers through a telephone communication network.

Subsequent contracts resulted in application of the DIALOG language to bibliographic databases of the Atomic Energy Commission, the European Space and Research Organization, the U.S. Office of Education, and the National Technical Information Service. In March 1969, for example, the ERIC Clearinghouse at Stanford demonstrated the use of DIALOG with an ERIC database of 415,000 citations. In the same year, DIALOG was installed on the European Space Agency's online system.

Lockheed's information service became commercially available in 1972 under the name of its retrieval language, DIALOG Information Retrieval Service, with two bibliographic databases of scientific and

technical information. By 1985 DIALOG had become the most comprehensive online information service in the world, with more than 200 separate databases in business and economics, chemical, patent and trademark information, science and technology, medicine and the biosciences, news and current events, education, directories, energy and the environment, law and government, computer science and microcomputers, books, the social sciences, and the humanities.

Mead Data Central (MDC). Mead is primarily associated with the full-text, online information services it created for primary sources in law and legal research. This service was introduced commercially in 1972 as LEXIS. Mead introduced NEXIS, a full-text information service for news and current events, in 1980, and MEDIS, for medicine, in 1985.

LEXIS was the product of an effort funded by the Ohio Bar Association between 1968 and 1970 to make Ohio case law searchable online. This effort of the Ohio Bar Automated Research (OBAR) group and the Data Corporation developed the first extensive full-text search capability. In 1968 Data Corporation was acquired by the Mead Corporation; in 1970 Mead Data Central, Inc. (MDC), was formed as a subsidiary of the Mead Corporation with Don Wilson and Gerry Rubin as its chief executive officers.

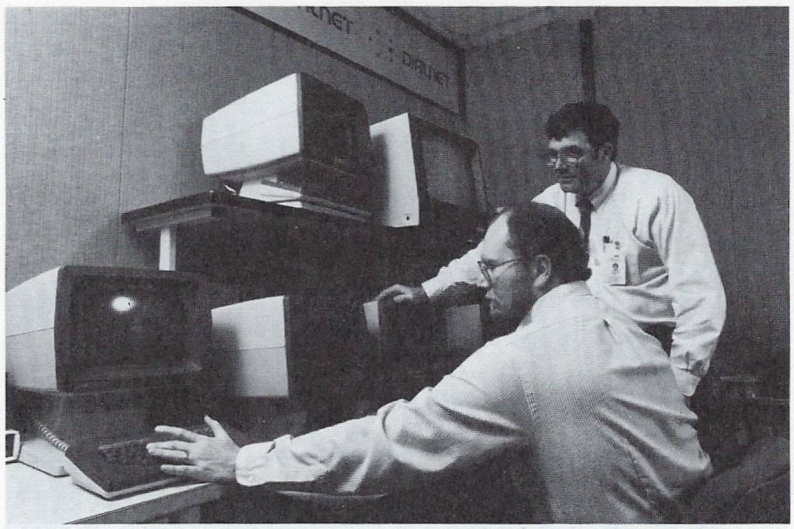
Mead initially fostered the use of its full text databases through dedicated, custom terminals. It later allowed them to be searched with such microcomputers as the IBM PC and the Apple Macintosh, using software it specifies.

Mead also offers full-text databases licensed from other producers such as the *Encyclopaedia Britannica,* the New York Times Online, and the National Automated Accounting Research System (NAARS). In 1985 Mead also introduced several bibliographic databases through its Reference Service.

Bibliographic Retrieval Services (BRS). BRS had its origins in the State University of New York (SUNY) Biomedical Communications Network (BCN). During a conference in Oxford, England, on the mechanization of library services in June 1966, Irwin Pizer described plans for the SUNY online information network. BCN began in October 1968, with online searches of the MEDLARS database for nine medical libraries, using a modified version of the IBM Document Processing System as the basis of its retrieval system. "In 1973," according to Bourne, "BCN adopted the IBM STAIRS system, added additional databases in subject areas other than medicine, and expanded to incorporate 32 member libraries." In May 1977 BRS became commercially available and BCN ceased.

BRS took a direct approach to soliciting suggestions from its user community through its User Advisory Board and its subcommittees on database selection and technical features. BRS grew by 1985 to include 73 separate databases in the life sciences, medicine and pharmacology; the physical and applied sciences; education; the social sciences and humanities; and business.

CAS ONLINE. This service is an outgrowth of the publishing efforts of one of the largest professional societies in the U.S. The American Chemical Society (ACS) began publishing its index to the chemical literature, *Chemical Abstracts,* in 1907. The Society founded the Chemical Abstracts Service (CAS) division in 1956 to manage the publication. In the late 1960s CAS developed an automated processing system and began building a database to improve text editing and formatting. CAS introduced CAS ONLINE in November 1980 as an online dictionary of chemical substances; it expanded in late 1983 to include the database of *Chemical Abstracts* citations dating back to 1967. CAS made available several million unlicensed abstracts for citations in that database on CAS ONLINE only. In 1984 ACS and Germany's Fachinformaszentrum Energie, Physik, Mathematik (FIZ Karlsruhe) joined their online information services to form STN International (the Scientific and Technical Information Network).



Dialog Information Services, Inc.

DIALNET Operations Center.

Pergamon INFOLINE. In the late 1970s a consortium of British producers of scientific, technical, and patent databases created INFOLINE, unsuccessfully planning to develop it as an online information service. INFOLINE was purchased by Pergamon Press, a British publisher of scientific journals and catalogues. After its advent as Pergamon INFOLINE in 1981, the service grew to include 33 separate databases by 1985. INFOLINE's strength is patent, scientific and technical, and business information, especially for companies in the U.K. Its typesetting and index production capability have enabled it to undertake comprehensive database production, such as the conversion to a bibliographic database of the British Patent Office Archives dating back to 1910.

WilsonLine and WilsonDisc. The H. W. Wilson Company was a pioneer publisher of indexes and abstracts for libraries. (*See* Wilson, H. W.) In the late 1980s, Wilson began issuing its publications in electronic format. By the 1990s, the company provided online access not only to all its own publications but also served as a gateway to other bibliographic databases like the *MLA Bibliography, LC MARC,* and the *GPO Monthly Catalog*. H. W. Wilson publications illustrate the management choices thrust upon libraries by the multiplication of electronic media as the same indexes and abstracts became available simultaneously in paper, CD-ROM, and online format, and as tapes to be mounted on the local library system.

OCLC and RLIN. The Online Cooperative