Chapter 4
Private Sector Health Information Systems

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INTRODUCTION

The growth and accomplishments of the private sector information industry in the past two decades are dramatic. In the area of information systems, there has been a tremendous increase in computerized data bases and on-line searching capabilities. Health-related bibliographic information is now available from not-for-profit institutions and for-profit corporations that are either devoted solely to information activities or operating as a division of a diversified conglomerate.

Some private sector organizations index and abstract biomedical and other health-related literature and produce printed indexes and computerized data bases. Other private sector firms, known as information services or vendors, sell on-line access to data bases usually leased from a variety of data-base producers in the public and private sectors. Still other firms-Bibliographic Retrieval Services and the Institute for Scientific Information—provide on-line searching of their own data

bases, just as the National Library of Medicine (NLM or the Library) does for the data bases it produces.

When data bases are leased, vendors often add information to them, or provide a unique language of commands (software) that makes data bases from several producers compatible. Thus, through a single vendor, a user can efficiently retrieve information from a variety of bases.

This chapter describes the various bibliographic health-related information products that are available from the private sector in order to provide background information for the discussion of domestic policy issues in chapter 6. Owing to the nature of the congressional requests for this OTA study, system issues such as quality of private sector data bases and effectiveness of services are not considered.

HISTORICAL ORIGINS

The historical origins of the private sector abstracting and indexing services, often referred to as secondary services, are rooted in the professional or learned societies that flourished in the 19th century. Although these services began with manually produced print products, the majority today produce a machine-readable product or data base as well. Many of the data base producers in the scientific and biomedical field remained in the not-for-profit sector, others were purchased by for-profit firms, and still others were initially profitmaking enterprises.

In almost all cases, public support in varying degrees was made available to the organizations —either to assist in the planning for conversion from manual to machine production of their products, or to assist in the development of new, large data bases. For example, BIOSIS (formerly Biosciences Information Service) and Chemical Ab-

stracts Service both received support from the National Science Foundation, and Excerpta Medica received grants and contracts from the Public Health Service.

Private on-line services originated later than many of the private scientific and biomedical data bases, but also are an example of Government and private sector interaction. Much of the original development of information search services (vendors) as they exist today was sponsored in a not-for-profit environment, predominantly through the Government's research and development expenditures. Usually, the services had been fully tried and tested before they were incorporated into private sector products and services.

Indeed, two of the three major commercial bibliographic services in the United States, DIALOG Information Services, Inc. (DIALOG) and System

Development Corp. (SDC), were recipients of Government contracts. Lockheed Missiles & Space Co. (formerly DIALOG's parent company) "developed its commercial activity on a foundation of Government service contracts from the Office of Education (ERIC), National Technical Information Service (NTIS), and the National Agricultural Library" (18). In return, the Government received an expanded work force and needed expertise. The third major commercial bibliographic service, Bibliographic Retrieval Services (BRS), was initially part of a State university system. Thus, the public sector, as well as private capital and individual initiative, was instrumental in stimulating the extraordinary growth of the information industry.

DATA BASES RELEVANT TO HEALTH SCIENCES

A compendium of data bases, including those in life sciences, chemistry, and social sciences relevant to biomedical research or health services can be found in various directories, such as *Computer-Readable Data Bases: A Directory and Source-book* (167). Certain data bases–BIOSIS PREVIEWS, EXCERPTA MEDICA, IRL LIFE SCIENCES COLLECTION, and SCISEARCH, whose contents focus on the basic biological sciences and clinical medicine—are described in this section.

BIOSIS PREVIEWS

BIOSIS PREVIEWS is a large international bibliographic data base covering the most frequently consulted journals in the life sciences, and is therefore of significant relevance to biomedical research and clinical medicine. It is produced by BIOSIS, a not-for-profit organization founded in 1926 to serve the information needs of the life sciences community. The journals BIOSIS PREVIEWS covers focus on basic research in the life sciences.

BIOSIS PREVIEWS is produced in connection with and corresponds in coverage to the printed versions of *Biological Abstracts (BA)* and *Biological Abstracts/RRM (BA/RRM). BA,* the larger, is an important bibliographic indexing and abstracting source covering primary research journals in the life sciences; *BA/RRM* is an analogous service covering reports, reviews, meetings, and books. BIOSIS PREVIEWS provides references to research literature in the life sciences, including agriculture, biochemistry, bioengineering, biophysics, ecology, experimental medicine, microbiology, and pharmacology.

Essentially all of the journal literature of original research in the life sciences is included. In 1981, 9,143 scientific journals from 116 countries were screened for inclusion, as well as books, monographs, meetings and conference proceedings, semipopular journals, research communications, and symposia. Journals comprised solely of articles on the life sciences are covered completely: every article and review is abstracted and indexed. Journals covering other sciences—physics, chemistry, and related topics—are screened for articles relevant to life sciences, and these articles are indexed and abstracted. Each article referenced counts as one citation (or "record").

Approximately 3 million records dating from 1969 are available on BIOSIS PREVIEWS. In 1982, BIOSIS will add 14,584 records from *BA* and 16,668 records from BA/RRM per month. *BA* and *BA/RRM* are updated twice a month. In 1981, more than 300,000 records were added; 315,000 will be added by the end of 1982. The citations and/or abstracts are keyed directly on computer tapes, which are mailed to vendors and are available to users approximately 5 weeks before the printed versions of *BA* and *BA/RRM* are available. Since December 1, 1980, abstract text from July 1, 1976, to the present is included to accompany BIOSIS PREVIEWS; these consist of English language summaries from *BA.* As of April 1982, access to BIOSIS PREVIEWS is provided by three commercial on-line search services in the United States and a total of 10 on-line services worldwide. There are also three off-line search

services in the United States and 11 outside the United States with access to BIOSIS PREVIEWS.

BIOSIS is operated by a board consisting of the President of BIOSIS and 12 rotating trustees who serve maximum terms of 6 years. Board members are chosen to represent the Federation of American Societies for Experimental Biology, the American Institute of Biological Sciences, the American Association for the Advancement of Science, the National Academy of Sciences, and a changing group of disciplinary societies.

In 1982, BIOSIS charges commercial search services $5,000 per year (plus the cost of 48 tape reels at $17.50 each) for the current file of BIOSIS PREVIEWS, and $6,600 per year (plus the cost of 24 tape reels at $17.50 each) for the abstract text package. In addition, BIOSIS charges the services $20.00 per connect hour in on-line usage royalties. Commercial search services are charged for off-line prints of BIOSIS PREVIEWS only if their charges exceed $0.10 per citation. They are also charged $0.09 for each abstract text printed off-line. Commercial search services include BIOSIS royalty and printing charges and their on-line fees in their user charges.

EXCERPTA MEDICA

Excerpta Medica is an information retrieval service that provides descriptive indexes of bio-medical and clinical literature. Sixty percent of its records include abstracts of the primary literature. Excerpta Medica was begun in 1946 as an independent not-for-profit foundation with some grant support from the U.S. and Netherlands' Governments. In 1971, Excerpta Medica was acquired by a private Dutch company, Elsevier-NDU, a major scientific publisher. Excerpta Medica now publishes two indexes of bibliographic references to the drug literature, 43 journals containing abstracts of articles published in the primary journal literature (see table 6), and 6 "core" journals containing abstracts of the most recent literature in discrete clinical specialties from the 43 specialty abstract journals.

A combination of professional, part-time, and volunteer abstracters and indexers—all practicing physicians—screen approximately 400,000 articles from over 3,5oo journals each year to produce EXCERPTA MEDICA (or EMBASE), a computerized data base of references to 240,000 articles per year; of these, 150,000 are abstracted for the 43 specialty journals. The data base is updated weekly.

EXCERPTA MEDICA was designed by and is addressed to clinicians, as well as to research scientists. All indexing is done by practicing physicians who also select, approve, modify, and in some cases rewrite abstracts of articles. By screening 3,5oo journals and reports of scientific symposia worldwide, EXCERPTA MEDICA covers

Table 6.—Excerpta Medica Abstract Journals

Anatomy, Anthropology, Embryology, and Histology
Anesthesiology
Arthritis and Rheumatism
Biophysics, Bio-engineering, and Medical Instrumentation
Cancer
Cardiovascular Diseases and Cardiovascular Surgery
Chest Diseases, Thoracic Surgery, and Tuberculosis
Clinical Biochemistry
Dermatology and Venereology
Developmental Biology and Teratology
Drug Dependence
Endocrinology
Environmental Health and Pollution Control
Epilepsy
Forensic Science Abstracts
Gastroenterology
General Pathology and Pathological Anatomy
Gerontology and Geriatrics
Health Economics and Hospital Management
Hematology
Human Genetics
Immunology, Serology, and Transplantation
Internal Medicine
Leprosy and Related Subjects
Microbiology: Bacteriology, Mycology, and Parasitology
Neurology and Neurosurgery
Nuclear Medicine
Obstetrics and Gynecology
Occupational Health and Industrial Medicine
Ophthalmology
Orthopedic Surgery
Oto-, Rhino-, Laryngology
Pediatrics and Pediatric Surgery
Pharmacology and Toxicology
Physiology
Plastic Surgery
Psychiatry
Public Health, Social Medicine, and Hygiene
Radiology
Rehabilitation and Physical Medicine
Surgery
Urology and Nephrology
Virology

SOURCE: *Excerpta Medica,* 1982.

the foreign, especially European, literature very thoroughly, and provides English abstracts. The *Drug Literature Index and Adverse Reactions Titles* are considered to be especially thorough; for drug-oriented searches of the literature, Excerpta Medica's DRUGDOC provides very comprehensive and complete bibliographies. These are deemed to be especially useful in their coverage of drug testing conducted in countries other than the United States.

Each of Excerpta Medica's abstract journals is produced under the supervision of one or more section editors who are practicing medical specialists in the Amsterdam area. Each section also has an International Editorial Board that does not

meet, but whose members are said to be available to provide advice on problems that occasionally arise in journal selection, classification, and terminology. A Board of Chief Editors coordinates the work of the section editors, and acts as liaison with the two executive chief editors, who are responsible for organization and management.

Two million records have been entered in EXCERPTA MEDICA since 1967. The data base is vended through DIALOG on a user fee basis, i.e., Excerpta Medica charges DIALOG a royalty each time a DIALOG customer accesses EXCERPTA MEDICA. DIALOG offers worldwide access to EXCERPTA MEDICA records entered since 1975, and is responsible for setting user fees.

IRL LIFE SCIENCES COLLECTION

Information Retrieval, Ltd. (IRL) is an independent, privately owned British company providing 17 abstracting services covering discrete areas in biological and medical sciences (see table 7). It began in 1966, with the publication of

Table 7.-IRL Abstracts

Animal Behavior
Biochemistry Abstracts
  Part 1: Biological Membranes
  Part 2: Nucleic Acids
  Part 3: Amino-Acids, Peptides, and Proteins
Calcified Tissue Abstracts
Chemoreception Abstracts
Ecology Abstracts
Entomology Abstracts
Genetics Abstracts
Immunology Abstracts
Microbiology Abstracts
  Section A: Industrial and Applied Microbiology
  Section B: Bacteriology
  Section C: Algology, Mycology, and Protozoology
Toxicology Abstracts
Virology Abstracts

SOURCE: Information Retrieval, Ltd., 19S1.

Microbiology Abstracts, and has grown steadily. IRL prides itself on complete and timely coverage of journals in its specialty areas, and on inclusion of books, conference proceedings, reports, patents, and the "fugitive" or "grey" literature (advertisements, announcements, unpublished and privately published reports). IRL currently screens 5,000 periodicals; its data base contains approximately 440,000 records entered since January 1978. The average growth has been 110,000 records per year, and the data base is updated weekly.

IRL products provide global coverage (less than 37 percent of its sources are of U.S. origin) and full abstracts in English or foreign language sources. The quality of indexing is controlled by having all indexing and abstracting done in-house by university graduates in the life sciences. The IRL LIFE SCIENCES COLLECTION is available on-line in the United States and worldwide through DIALOG.

SCISEARCH

SCISEARCH is a multidisciplinary bibliographic data base prepared by the Institute for Scientific Information (ISI), a private for-profit company located in Philadelphia. ISI markets an

assortment of services and publications designed to provide a comprehensive and coordinated information discovery and retrieval system. These include a weekly early alert journal *(Current Con-*

tents); a selective information dissemination service *(Automatic Subject Citation Alert);* and a document dissemination service (Original Article Text Service). It also produces three comprehensive on-line interdisciplinary data bases: *Science Citation Index (SCI)* (available on-line as SCISEARCH); *Social Sciences Citation Index* (available on-line as SOCIAL SCISEARCH), and Arts *and Humanities Citation Index* (also available in on-line).

SCI consists of four separate but related indexes: *Citation Index, Source Index, Permuterm Subject Index,* and *Corporate lndex. Citation Index* is arranged alphabetically by cited author. A reference entry contains the primary author's name, the year the cited item was published, and an abbreviated name of the publication with its volume and page number. The source items citing a particular reference are arranged alphabetically by source author immediately under each reference item. *Source Index* is similar to an author index with the full citations—author, titles of article and journal, date of issue—to all source references. *Permuterm Subject Index* is an index in which all significant title words of the source items are permuted, forming all possible pairs of terms. Primary terms are arranged alphabetically, and all the co-terms occurring with a particular primary term are listed alphabetically under that term. *Corporate hdex* lists source authors by both geographic location and organizational affiliation. SCIand SCISEARCH identify articles but do not provide abstracts.

SCI's coverage of over 3,000 journals is based on a principle which is different from that of other scientific retrieval services: the concept of citation indexing. Citation searching assumes that if a particular article or set of articles or author has material directly relevant to the subject of interest, then other articles or authors citing that material are also likely to be relevant. (This is also known as "forward" searching. *(Shepard's Citations,* a commonly used legal reference, uses this principie.) A *citation index* is a structured list of all the citations in a collection of documents.

Citation indexing takes advantage of the built-in linkages between documents provided by author's citations by listing together all items with common citations, and thus provides multidisciplinary searching capabilities. Thus, SCISEARCH is complementary to data bases built along traditional disciplinary lines.

SCISEARCH can trace a scientific idea forward in time, i.e., from an earlier cited article to a later citing article. It is based solely on the scientist to author's decisions to reference other articles. Since the intellectual intervention of human abstracters or indexers is not required, SCISEARCH reflects scientists' research practices and their own vocabularies. Because SCI is based on citation indexing, significant items of information other than journal articles can also be retrieved. They include technical reports, patents, and material published in books or the popular press—in fact, any item that is cited by the author. This citation feature also alerts users to relevant materials, including historical articles, that may have been written long before SCI was produced, and before other (alternative) data bases were accessible via computerized searches.

SCISEARCH contains approximately 3 million records and is updated biweekly. It is available on-line from 1974 to the present through DIALOG. It is priced differently to and by each search service, depending on the year accessed and on whether or not the on-line user is a subscriber to the printed version of *SCI.*

COMMERCIAL SEARCH SERVICES

In the private sector, the major on-line biomedical and health information search services are BRS, DIALOG, and SDC. They acquire data bases from a number of sources: private sector producers, both profit and nonprofit, and Government organizations, such as NLM, NTIS, and the National Agricultural Library, and offer their users the ability to search them with a single software system. Table 8 is a listing of prices to users for selected data bases.

Table 8.—On-Line Connect Hour Rates[a] for Selected Health-Related Data Bases, Spring 1982

Data base	BRS	DIALOG	NLM	SDC
BIOSIS PREVIEWS	$41-55	$43-58		$65
CA SEARCH	40-54	49-64		68
EXCERPTA MEDICA		55-70		
IRL LIFE SCIENCES COLLECTION		30-54		
MEDLINE	19	20-35	$15-22	
SCISEARCH		50-65[b]		
		150-165[c]		
HEALTH		20-35	15-22	
ENVIROLINE	61-75	63-78		90
TOXLINE			45-52	
CHEMLINE			94-101	
AGRICOLA	18-32	20-35		40
NTIS	24-38	25-40		45

[a]Prices are not directly comparable. Some information services may vend the same data base but the data base may span different periods of time. The telecommunications costs also vary, as does the office printing and other costs. For more specific information see tables 9, 10, and 11.
[b]Subscribers.
[c]Nonsubscribers.

SOURCE: BRS, DIALOG, NLM, SDC, 1982.

Each of the vendors offers a different package of software capabilities to its users. All major capabilities offered by the NLM MEDLARS II system are duplicated in the commercial search services. However, because of the intense competition in the information industry, the search services revise and expand their capabilities more rapidly than NLM. Their users can, for example, search whole data bases on phrases they compose themselves by asking for words to be in a certain proximity to one another. They can review their search strategies on the holdings of all or any group of data bases from one search service without having to reenter terms in one data base after another. They can order documents retrieved in on-line searches. They can put their own private files on-line for searching on the vendor's software. As noted in chapter 2, the plans for MEDLARS III include the acquisition of functions now available on commercial search services, except for the purely commercial ones, such as putting a user's private files on-line for searching. Samples of the capabilities specific to each search service are included in the following descriptions.

Bibliographic Retrieval Services, Latham, N.Y.

BRS initially focused specifically on the biomedical data bases, but it has since broadened its coverage by adding ones in science, business, and technology. The company now offers over 50 files on-line.

BRS began as the Biomedical Communications Network (BCN) at the State University of New York (Albany). BCN provided on-line access to nine data bases, including MEDLINE and BIOSIS PREVIEWS, to large universities and medical schools primarily in the Northeast. State funding for the project was withdrawn in 1975, and BRS was formed as a not-for-profit concern the following year, It was incorporated in May 1976 as a for-profit corporation. In 1980, BRS was purchased by Indian Head, Inc., a subsidiary of the Dutch company, Thyssen-Bornemisza.

User Profile

In the biomedical area, BRS estimates indicate that its users can be categorized by type of institution: 55 percent academic; 18 percent corporate industrial; 15 percent governmental (including the U.S. National Institutes of Health and 30 Veterans Administration hospitals); 6 percent miscellaneous (including public and State libraries). In terms of individuals, BRS estimates that 90 to 95 percent of its activity is handled by trained intermediaries (librarians or searchers) and that the remaining 5 to 10 percent is done by academic investigators in science. For 1980, BRS estimates that physicians comprised no more than 1 to 2 percent of its trained searchers. The number of users is considered proprietary information. Passwords are issued to both individuals and organizations. Health-related data bases offered by BRS are listed in table 9.

costs

The BRS rate for searching the MEDLINE data base is $15 per hour, excluding telecommunications charges and the NLM $4 per hour royalty charge. The costs for accessing all other BRS data bases are shown in table 9. BRS' on-line connect hour rates depend on the number of hours of searching in 1 year. Users subscribe according to their projected use at the following rates. Any royalties which are charged by the data base producer are added to these subscription fees.

**Table 9.—BRS: Selected Health-Related Data Bases Available On-Line,
March 1982**

Data base	On-line connect time rate per hour[a]		Off-line print rate per citation
	Minimum	Maximum	
Major relevance health *care*			
BIOSIS PREVIEWS	$41	**$55**	—
CA SEARCH.	40	**54**	$0.10
HEALTH	15	**15**	
MEDLINE	19	**19**	**0.10**
MEDIC	21	**35**	—
PRE-MED	16	**30**	—
Relevant to some specialties and interests			
AGRICOLA (CAIN).	18	**32**	
DISSERTATION ABSTRACTS	24	**45**	
DRUG INFO AND ALCOHOL USE/ABUSE . . .	21	**35**	**0.05**
ENVIROLINE	61	**75**	**0.10**
URIC	21	**35**	**0.05**
NIMH (NCMH)	16	**30**	
NTIS	24	**38**	
POLLUTION ABSTRACTS	51	**65**	0.10
PSYCHOLOGICAL ABSTRACTS	46	**60**	—
SSIE.	**46**	**60**	0.10

[a]Connect time costs include royalties paid to data base suppliers, but do not include telecommunications costs of $5 to $7 per connect hour.

SOURCE' Bibliographic Retrieval Services, 1982

BRS On-Line Rates, **February 1982**

Number of annual connect hours	Annual subscription payment	Cost per computer connect hour
25	$ 750	$30
60	1,500	25
120	2,400	20
240	3,800	16

User Training

New users are introduced to the entire BRS system in a l-day training session, which costs $35 for subscribers and $55 for nonsubscribers. BRS has a special l-day training session for MEDLARS, which costs $5O, and similar sessions for other data bases. Approximately 300 training sessions are conducted each year. The sessions are held in major U.S. metropolitan a reason a monthly or bimonthly basis, and in other on site locations at the request of users or potential customers.

Value-Added Services

BRS has also created a file called PRE-MED that updates the primary English-language medical journals weekly with bibliographic citations not yet available on MEDLINE. BRS also carries the full text of all 16 of the journals from the American Chemical Society.

BRS places a particular emphasis on marketing a Private-file Service. Users can mail them machine-readable files of their own data—library catalogs, academic departmental publications lists, etc.— and BRS will put the data on its computers and offer on-line retrieval with its software at a competitive price. If the information is not currently machine-readable, BRS offers a number of options from a preprogrammed microcomputer for local input to a direct on-line data input program. BRS also offers electronic messaging for communication among groups of users and an electronic newsletter capability.

DIALOG Information Services, Inc., Palo Alto, Calif.

In 1966, DIALOG Information Services (DIALOG), then a subsidiary of the Lockheed Missiles & Space Co., developed the first on-line retrieval system that went beyond the demonstration stage to regular production (18). This system, also called DIALOG, is the basis for systems currently in operation at several Government agencies, including the National Aeronautics and Space Administration and the Justice Department. The system has been commercially available since

1972, and now provides access to over 120 data bases for 10,000 users in 40 countries (18). Six of its data bases are of major relevance to health and biomedicine.

Initially, DIALOG focused on education and science, but it now offers data bases covering business, social science, and the humanities. The company is expanding DIALOG's health coverage: INTERNATIONAL PHARMACEUTICAL ABSTRACTS and EXCERPTA MEDICA were added in 1975; MEDLINE was added in 1981; and NLM's TOXLINE and HEALTH data bases are expected to be added in the near future. This firm is the largest commercial vendor of on-line biomedical bibliographic information in the world.

User Profile

The DIALOG system has over 10,000 users. It is company policy not to disclose specific information about users because of competition with other vendors. "Users" in this case means "passwords" and is roughly equivalent to organizations. However, some complex organizations and institutions may have several libraries or information centers with terminals and thus have several passwords.

costs

DIALOG's access charges are displayed in table 10. A number of discounts are available, all based on monthly usage levels. The maximum discount of $15 per hour is available for a guaranteed usage of 80 hours per month.

Like BRS, DIALOG bases its prices at least in part, on a projected market value of each data base and service. Market value is determined by the nature of the data base, the user population (e.g., financial communities are likely to pay more for a service than academic users), and competitors' prices.

User Training

DIALOG makes its services available to potential users by conducting 1,2oo training sessions in 100 U.S. metropolitan areas and other sites at customer request. These consist of a general n/z-day training session for use of the entire DIALOG system, augmented by specialized training sessions for a half-day each on EXCERPTA MEDICA, on MEDLINE, and on BIOSIS. The charge is $65 for the general training session (which includes on-line practice) and $25 for the specialized sessions. These courses are attended mostly by librarians or specialized on-line searchers in universities, and in increasing numbers by physicians and scientists (end users).

All DIALOG data bases are completely on-line. Unlike NLM or BRS, DIALOG does not put earlier years of data bases into backfiles for off-line processing; DIALOG puts them into backfiles for on-line processing. DIALOG also offers a private file service. The company's DIALORDER system covers more on-line ordering sources than any other vendor. The company also carries electronic newsletters and on-line directories.

System Development Corp., Santa Monica, Calif.

SDC was established as a not-for-profit company in 1956 as part of the Rand Corp., a consulting firm established after World War II to provide research services to the Air Force. SDC initially trained operators and programmers for the SAGE early warning system. SDC became a free-standing, for-profit corporation in 1968. It has been involved with biomedical and health services data bases since 1968, when it assisted NLM in developing ELHILL, the software package for MEDLARS. SDC modified the ELHILL software for the ORBIT package it now uses. The company was purchased by the Burroughs Corp. in 1980. It has more than 80 data bases that provide coverage of information in many areas of knowledge.

User Profile

There is no systematic information available about SDC users in the biomedical/health services area, but an estimated 15 to 20 percent of its total business is in the medical area. Of SDC's total customer population, an estimated 60 to 65 percent are from private business and industry, 15 to 20 percent from Government agencies, and the remaining 15 to 25 percent from academic institu-

**Table 10.—DIALOG: Selected Health-Related Data Bases Available On-Line,
April 1982**

Data base	On-line connect time rate per hour[a]		Off-line print rate per full report
	Minimum[b]	Maximum	
Major relevance to health care			
BIOSIS PREVIEWS (1969 to present)	$43	*$58*	$0.15
CA SEARCH (1967 to present)	*49*	*64*	**0.20**
EXCERPTA MEDICA (1974 to present)	*55*	*70*	**0.20**
HEALTH	20	35	**0.15**
IRL LIFE SCIENCES COLLECTION	30	45	**0.15**
MEDLINE (1966 to present)	20	*35*	0.15
SCISEARCH (1970 to present)			
(subscribers)	50	*65*	0.15
(nonsubscribers)	150	*165*	0.25
Relevant to some specialties and interests			
AGRICOLA (1979 to present)	20	*35*	0.10
CHEMNAME	115	130	**0.20**
CHILD ABUSE AND NEGLECT	20	35	**0.10**
COMPREHENSIVE DISSERTATION INDEX	40	55	**0.12**
ENVIROLINE	63	78	**0.15**
ENVIRONMENT BIBLIOGRAPHY	45	60	**0.15**
FOODS ADLIBRA	40	55	**0.10**
FOODS ADLIBRA	40	55	0.10
INTERNATIONAL PHARMACEUTICAL ABSTRACTS	*35*	50	0.15
NTIS	25	40	0.10
PHARMACEUTICAL NEWS INDEX	*80*	95	0.30
POLLUTION ABSTRACTS	*58*	73	0.20
POPULATION BIBLIOGRAPHY	40	55	0.10
PSYCHOINFO	50	65	0.10

[a]Connect time rates include royalties paid to data base suppliers, but do not include telecommunications costs of $6 per connect hour.
[b]Minimum connect time rate applies for users with a discount contract.

SOURCE: DIALOG Information Services, Inc. 1982.

tions. At the present time, SDC is persuaded that the majority of its users in the biomedical area are from pharmaceutical firms, with very few from academic or medical institutions. SDC hopes to attract a larger portion of the health and biomedical consumer market when it adds MEDLINE and TOXLINE, partly in response to requests from customers and reports from field representatives.

costs

Three of the SDC offerings have annual subscriptions for the printed indexes produced from each data base, but SDC has no subscription costs, startup fees, or monthly minimums of its own. Discounts are available to users for more than 5 hours of connect time each month, to a maximum discount of $2o for 140 hours per month. SDC's charges are shown in table 11.

User Training

SDC holds regular training sessions for new users in major cities. Approximately 125 sessions are held each year in 18 locations. Users are taught the basic techniques of the ORBIT software system by professional instructors. New-user training sessions last 1%-days and cost $150 per person; this fee is credited back to the account of the user. The session includes a training package, on-line practice, and 3 hours of computer time. There are additional half-day seminar sessions for life sciences data bases, at $5o per session. In addition, custom-designed classes are available at the

Table 11 .—SDC: Selected Health-Related Data Bases Available On-Line, March 1982

Data base	On-line connect time rate per hour[a]	Off-line print rate per citation
Major relevance to health care		
BIOSIS PREVIEWS		
(1969 to present)	$65[b]	$0.10-0.25
RINGDOC[c]		
(1964 to present)	100	0.13
CA SEARCH		
(1967 to present)	68	0.20
Relevant to some specialities and interests		
AGRICOLA		
(1978 to present)	**40**	*0.06*
CHEMDEX	**125**	*0.25*
ENVIROLINE	**90**	0.20
NTIS	**45**	0.10
PESTDOC[c].	**100**	0.13
PSYCINFO.	**65**	0.10
SAFETY SCIENCE ABSTRACTS	**75**	0.15
SPORT	**85**	0.15
SSIE	**110**	0.25
VETDOC[c].	**100**	0.13

[a]Connect costs include royalties paid to database suppliers, but do not include telecommunications costs of $8/hour.
[b]SDC also has a discount plan that applies to all accounts that use SDC's system, ORBIT, for at least 5 hours in a given month. The discount is applied in steps dependent upon the number of connect hours used in a given month on all data bases.
[c]RINGDOC PESTDOC and VETDOC require a yearly subscription to the printed journal from Derwent Publications before they can be accessed on SDC. These subscriptions costs as of 1981 were:

    PESTDOC $11,275/yr
    RINGDOC   30,350/yr
    VETDOC   7,625/yr

SOURCE: Systems Development Corp. 1982

customer's location on request, at a cost of $450 plus the trainer's travel costs.

Value-Added Services

SDC has recently developed advanced cross-file searching capabilities for its ORBIT software comparable to that used by DIALOG and BRS. Users can create their own thesaurus of terms by browsing through lists of terms in one data base and carrying those lists over into other bases. If a searcher finds a particularly interesting citation in one file, he or she can command the system to enter the terms appearing in that citation into their search strategy automatically. Searchers more familiar with softwares other than ORBIT can rename commands and have those changes automatically executed whenever they enter their password. SDC also developed the first on-line ordering system, the Electronic Maildrop, whereby users can place an order for an original document at their terminal.