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ABSTRACT

Eight public libraries participated in a two-year experiment to investigate the potential of the public library as a "linking agent" between the public and the many machine-readable data bases currently accessible using on line computer terminals. The investigation covered users of the service, impact on the library, conditions for successful use of on line reference services, and financial and marketing aspects of such a service. It was found that: (1) the public library can be an effective provider of on line retrieval services, (2) allocation of reference service staff time is one of the most important factors in the success of the service, (3) on line searchers must complete some "critical mass" of searches each month to maintain their search skills, (4) the attitude of the head reference librarian affects the speed and efficiency of the service, (5) there is a segment of the public that is willing to pay for on line searches, and (6) provision of an on line search service does not in the short term alter the public image of the library. (JY)

TWO YEAR INTERIM REPORT

INVESTIGATION OF THE PUBLIC LIBRARY AS A LINKING AGENT TO MAJOR SCIENTIFIC, EDUCATIONAL, SOCIAL, AND ENVIRONMENTAL DATA BASES

LMSC-D502595 1 September 1976

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FOREWORD

This report presents the results of the first 2 years of the DIALIB project, a study supported by the National Science Foundation, * to investigate online search in a public library setting. We have attempted to capture not only the formal evaluative material, but also the very valuable informal comments expressed by participants. (See Appendix B.)

The report is given in three volumes:

Main Report. The present volume describes the project, and summarizes the evaluation and publicity material given in the Annexes.

Annex 1: Evaluation. This Annex presents the detailed project evaluation prepared by Applied Communication Research. It provides extensive statistical tables, and detailed analyses of the results obtained.

Annex 2: Publicity. This Annex presents the publicity plan, evaluation material pertinent to publicity, comments of participants regarding publicity, and many examples of the publicity used.

Copies of the main report and the annexes are available from Lockheed Information Systems while the supply lasts, and thereafter from the National Technical Information Service (NTIS) and ERIC.

*Grant SIS74-13972, User Support Program, Division of Science Information, NSF.

ABSTRACT

This report describes the first 2 years of an experiment that investigated the potential of the public library as a "linking agent" between the public and the many machine-readable data bases currently accessible via the telephone line using online terminals. Four public libraries in Northern California, members of the Cooperative Information Network (CIN), were the original participants in the study; four additional libraries in other parts of the country were introduced in the middle of the second year.

The study investigated the following questions:

- Is online search of use to the patrons of a public library?
- What impact does such a system have on both the library and the patron?
- What conditions are required for successful use of online reference search in the public library?
- What are the financial and marketing aspects of such service?

The investigation was conducted by Lockheed Information Systems, and Lockheed also provided the DIALOG® online search service. Evaluation was performed by Applied Communication Research, a nonprofit behavioral research firm in Palo Alto, California. The project was reviewed by an Oversight Committee of five experts in various specialities of public librarianship, marketing, and information science.

Some general conclusions suggested by the evaluation data are:

(1) The public library can be an effective channel through which to provide an online retrieval service, but libraries are not all equally well suited to provide such service.

(2) The allocation of reference service staff time is one of the most important factors to be considered in planning an online search service.

(3) To maintain search proficiency, online searchers must complete some "critical mass" of searches each month in each data base for which proficiency is desired; the large number of different data bases makes it difficult for an individual to maintain a thorough knowledge of each data base.

(4) The attitude of the head reference librarian toward online retrieval affects the speed and efficiency with which searches are completed.

(5) Fee-for-service did not bring the problems that many librarians had feared; there is a segment of the public willing to pay for such search service, and fee collection is straightforward.

(6) The provision of online search has done little in the short term to alter the image of the public library in the community it services.

The original 2-year study was extended to a third year to obtain evaluation data on the impact of charging patrons for the full cost of online search service, as well as to develop a more complete conceptual framework for the study. The present interim report therefore only describes the first 2 years of the experiment; the final report will be available in the Fall of 1977.

ACKNOWLEDGMENTS

This study could not have been carried out without the cooperation of the following people:

Dr. Joel Goldhar and Mr. Richard Lee, User Support Program, Division of Science Information Service, National Science Foundation

Dr. Alice Ahlgren, Applied Communication Research, Inc.

Board of the Cooperative Information Network, and the CIN Online Committee, Mrs. Patricia Bergsing and Mr. Don Fuller

The directors of the CIN libraries: Mr. Homer Fletcher, City Librarian, San Jose Public Library; Miss Barbara Campbell, Santa Clara County Librarian; Mr. Karl Vollmayer, City Librarian, Redwood City Public Library; Mr. James Buckley, San Mateo County Librarian

The reference librarians: see Appendix C for the complete list, but special thanks to Charlotte Sakai, San Jose Public Library; Lois Thomas, Santa Clara County Library; Sally Drew and Lisa Nacf, Redwood City Public Library; and Ann Scott and Nancy DeWath, San Mateo County Library.

The Oversight Committee: Mrs. Virginia Ross Geller, Geller and Ross; Prof. Albert Rubenstein, Northwestern University; Mr. Forrest Carhart, Director, METRO; Prof. Charles Bourne, University of California, Institute of Library Research; Mr. Douglas Ferguson, Stanford Libraries

Evelyn Helmer, Publicity Coordinator

The non-CIN libraries, Marion Huttner and Carol Vantine, Minneapolis INFORM system; Mrs. Judith Neufeld, Long Island Library Resources Council; Ann Landtroop, Houston Public Library; Jean Davenport, Cleveland Public Library

Our thanks go to all the participants listed in Appendix C.

CONTENTS

ILLUSTRATIONS

Section 1
DESCRIPTION OF THE STUDY

It is now possible to perform online computer searches of large bibliographic data bases ranging from one-quarter of a million to a million citations each. These data bases span the spectrum fr scicnce and technology to social sciences and business. Several retrieval services such as the Lockheed DIALOG® system and the Systems Development Corporation's ORBIT system offer such service at rates ranging from $35 to $150 an hour, depending on the data base used. In addition, the user must pay the communication cost (the cost of a direct telephone call to California or approximately $10 an hour via a local Tymshare or Telenet port) and terminal rental cost (approximately $150 a month, including maintenance).

A decade ago, such online access to large bibliographic databases was restricted to large governmental organizations that had the financial assets needed to prepare large databases and to access them in an efficient manner. As a result of reduced computer and communications costs, this access has been extended to industrial users and universities at a reasonable cost through more than 15 services in the United States (Ref. 1). As yet, however, no extensive use of these services is made by the general public. What is required, as shown schematically in Fig. 1-1, is a "linking agent" to bring together the data base resources and the general user public.

1.1 THE DIALIB STUDY

In late 1973, Lockheed Information Systems submitted a proposal to the National Science Foundation to conduct a study to examine means by which the public library could act as a l-king agent to the general public in providing online information retrieval servic s.

In 1974, the User Support Program of the Office of Science Information Service, National Science Foundation, established a grant to enable Lockheed Information

Fig. 1-1 Concept of a Linking Agent Between the Public and Information Resources

Systems to work with the Cooperative Information Network (CIN), an information cooperative in Northern California, to establish online search services using the DIALOG System (see Appendix A) in four Cooperative Information Network public libraries. The project is referred to as the DIALIB project. A nonprofit behavioral research firm in Palo Alto, California, Applied Communication Research, Inc. (ACR), was selected to perform an independent project evaluation.

The NSF grant summary was as follows:

> The purpose of this project is to conduct an operational experiment to test the feasibility, economic viability, and utility to users of using the existing library systems to provide public access to computerized (online) scientific and technical information services (query, search, and retrieval) heretofore unavailable and inaccessible to either the general public or the scientist/engineer in smaller organizations; and to determine the impact of such services on both libraries and service users. The project entails a two-year program to be carried out in several libraries of the Cooperative Information Network of San Mateo and Santa Clara Counties in California. The online retrieval capability, which will be provided by the Lockheed DIALOG system, offers access to a wide range of engineering, science, psychology, agriculture, and educational technology data bases, including NTIS, CAIN, ERIC, INSPEC, COMPENDEX, and PANDEX. Statistical data are to be collected and analyzed with respect to (1) utility and utilization of public libraries as technical information dissemination centers, and (2) marketing variables and marketing methods for motivating new users of services providing online access to scientific and technical information. Basic study areas include the investigation and analysis of the financial, administrative, user, technical, and marketing aspects of computerized online information services in relation to other library services.

Thus, some of the objectives of the study were the following:

(1) Determine how useful an online retrieval service is in meeting the needs of the general public.

(2) Develop a user profile that will assist library administrators in identifying the principal users of the system, the ability of patrons to pay for system use, and the type of information patrons require.

(3) Examine the effect of the online service on the library reference service and isolate causes for acceptance or rejection of the service.

(4) Determine the actual costs of providing such a service and outline the factors contributing to these costs.

(5) Identify the specific characteristics of different libraries which would have an effect on the operation.

In September 1976, the National Science Foundation extended the time period one additional year so that we could obtain evaluation data on the impact of charging patrons for the full cost of search, as well as to develop a more complete conceptual framework for the study. The present 2-year interim report therefore only describes the first 2 years of the experiment; the final report will be available in the Fall of 1977.

It must be kept in mind that the experiment involved public libraries operating under different administrative policies and not under strict experimental control. Thus, when we try to communicate the results of the study, we are like the blind men in the fable, each touching a different part of the elephant, and trying to communicate the nature of the creature to others.

1.2 DESIGN OF THE STUDY

The study was designed as a 2-year study in which the first year of online service was to be provided at no cost to the libraries, and the second year was to be at one-half the usual charge for search time. The four CIN-member public libraries were to determine how the funds for the second-year operation were to be raised. Because of severe budget cuts experienced by these libraries, they all chose to pass the online search service costs on to the patron, while they paid for library personnel and communication costs. (The terminal rental was paid by the grant.)

The libraries each determined how the online service was to be integrated into their system. Since each of the libraries was in a different county/city jurisdiction, and was organized somewhat differently from the others, different approaches were taken to serving the public. There was, therefore, variation found in the evaluation data from library to library, and this variation is discussed in Annex 1, Evaluation Report.

1.2.1 Project Coordination

In the early stages of the project, monthly review meetings were held to iron out difficulties and to review the ACR evaluation requirements, but by the second year very few meetings were required. The libraries also submitted monthly reports to Lockheed, indicating problems, experience with the system, and suggestions, and these reports were then circulated to all the participating libraries.

1.2.2 Publicity

Public libraries have always had the problem of publicizing their service to attract the attention of potential patrons. With the inception of online retrieval service, and particularly with fee-based search, this becomes an even greater problem.

Early in the project it was realized that a publicity expert was required to coordinate and develop publicity for the online service, and the CIN Online Committee recommended Mrs. Evelyn Helmer, Public Information, San Mateo County Library. Her four-stage publicity plan is given in Appendix D and the publicity material developed is given in Annex 2.

1.2.3 Librarian Training

Librarians from each of the participating libraries were given the standard Lockheed 2-day training course, and they spent about 1 month familiarizing themselves with the system before dealing with patron searches. As time went by, skilled searchers left and others were trained to take their place, usually by sending them to the Lockheed training program. In addition, librarians attended special data base presentations, such as those given by Predicasts or by Biosciences Information Service (BIOSIS) in nearby cities.

Searchers received the DIALOG Chronolog, a monthly publication describing the latest features of the system, offering hints on system use, and indicating characteristics of the latest data bases available. They also received "DIALIB Notes," an

informal series of notes that discussed their common mistakes in searching, new data bases, and interesting search techniques. During the pay period, searches were reviewed and the results of this review were discussed in these DIALIB notes. (See Appendix E for common errors found in searches.)

It must be kept in mind that DIALOG was in a period of rapid expansion during this 2-year period, during which time the number of data bases increased from about 18 to over 35. Thus, in some of the remarks of the participating librarians given in Appendix B, one will find statements about the lack of time they had to keep up with this rapid growth.

1.3 ROLE OF THE STUDY PARTICIPANTS

The following organizations participated in the study. Their specific responsibilities with regard to the study are indicated.

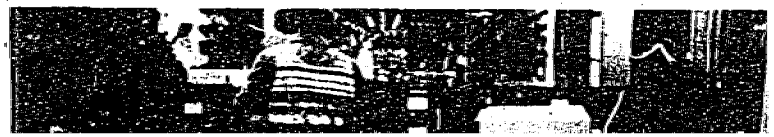
- Joint Board of the Cooperative Information Network (CIN). CIN is an organization consisting of representatives of public and private libraries in San Mateo and Santa Clara Counties, in California, which has been in existence for nearly 5 years. Its purpose is to deal with mutual problems, share information resources, and coordinate joint activities of the member libraries. The role of the Joint Board of CIN in the present study was to review overall progress of the study, and make policy decisions, as required.
- CIN Online Retrieval Committee. This committee was appointed by the CIN Board to act as liaison with Lockheed Information Systems. The Online Committee consisted of Mrs. Patricia Bergsing, Burlingame Public Library, and Mr. Donald Fuller, Santa Clara (City) Public Library.
- Lockheed Information Systems. Under Dr. Roger K. Summit, Project Director, and Mr. Oscar Firschein, Principal Investigator, Lockheed provided the overall management, technical guidance, and coordination. In addition, Lockheed was responsible for providing the DIALOG online retrieval service, and training of library personnel. Lockheed prepared periodic reports for the National Science Foundation, conducted review meetings, and reviewed searches performed by the libraries.

- Applied Communication Research. Project evaluation was the responsibility of Dr. Alice Ahlgren of Applied Communication Research, Inc., a Palo Alto nonprofit behavioral research firm. She was responsible for preparation of the evaluation tools, coordination with the libraries concerning their use, and analysis and reporting on the results.

- Oversight Committee. To review the progress of the experiment, an Oversight Committee consisting of impartial experts in the field of experimental design, public library administration, and user studies was formed. The committee consisted of Professor A. Rubenstein (Northwestern University), Mrs. Virginia Ross Geller (Geller and Ross), Professor Charles Bourne (University of California, Berkeley), Mr. Forrest Carhart (METRO), and Mr. Douglas Ferguson (Stanford Libraries).

- CIN Libraries. In June 1974, the CIN Board selected four libraries for the experiment, with each library representing a somewhat different type of library service: a large city (San Jose Public Library); a county library in a suburban area (Santa Clara County Library at Cupertino); a county library with no walk-in traffic (San Mateo County library, Belmont); and a smaller city library with much walk-in business (Redwood City Public Library). The libraries provided the services of the reference librarians, paid for communications costs, and provided space for the terminals. In addition, the librarians gave talks and presentations to various civic and governmental organizations to publicize the service. Figures 1-2 and 1-3 show the terminal locations in the four CIN libraries. All but the San Mateo County installation are in patron areas.

- Non-CIN Libraries. After the first year, the NSF suggested that the experiment be expanded to include those libraries able to deal with nonsubsidized search. The intent was to obtain experience in passing the full cost of the search on to the public library. New libraries would be given free demonstration time and a free terminal for a 6-month period, but would be billed at full cost of a DIALOG search. The libraries could then pass this cost on to the patron, if there was no internal budget to support this service. This would provide data on the acceptance of a full-charge system by the public. Four public libraries agreed to participate in the project: Minneapolis Public Library (INFORM); Cleveland Public Library (FACTS FOR A FEE); Houston Public Library; and the Long Island Library Resources Council. A complete description of these libraries and their participation is given in Appendix A of Annex 1.



Redwood City Public Library,
Redwood City, California

San Mateo County Library,
Belmont, California

Fig. 1-2 Terminal Locations for Participating Cooperative Information Network (CIN) Libraries

Santa Clara County Library,
Cupertino, California

San Jose Public Library,
San Jose, California

Fig. 1-2 Terminal Locations for Participating Cooperative Information Network (CIN) Libraries (Cont.)

1.4 PROJECT CHRONOLOGY

The highlight events of the project are given below. Details were given in the Quarterly Reports indicated. A list of project meetings and papers presented is given in Appendix G.

June – August 1974 (First Quarterly Report)

- Participating libraries selected by CIN Board.
- Legal agreements prepared and signed between the libraries and Lockheed.
- Oversight Committee selected, and had first meeting at Lockheed Palo Alto Research Laboratory.
- Opening ceremonies at the San Jose Public Library, with attendant publicity.
- Meeting with heads of participating libraries regarding pricing policy for second year.
- Installation of terminals, training of library personnel, and initial operation.

September – November 1974 (Second Quarterly Report)

- User evaluation begun by ACR with distribution of questionaires and forms.
- Problems arise because high patron use of the system overloaded the reference staff.
- Publicity plan, Stage 1 (distribution of bookmarks, posters, and brochures), and Stage 2 (promotional mailings to local business) carried out. Many newspaper stories appear in local press.

December 1974 – March 1975 (Third Quarterly Report)

- Intensive preparation for the fee portion of the study. Participating libraries decide that restricted budget makes it impossible to budget any library funds for project, and that all such costs will be passed on to the patron. Members of Oversight Committee express disappointment that not even token funds are forthcoming from libraries.
- Because of the high level of search activity, participating libraries request financial support for search personnel. NSF approves a $10 per terminal hour subsidy for this purpose (demonstration time is not included).

- "Standard search" proposed by Lockheed because of concern expressed by librarians concerning cost of search to patron.
- Crisis at San Jose Public Library because of an overload condition created by San Jose State University students. A request was made from the library to the City Council that it be allowed to withdraw from the project; request is denied because of use to community. San Jose Library School provides a graduate student to deal with overload, and situation is resolved.
- Legal form for fee period is developed by libraries.
- Oversight Committee meets and discusses the San Jose situation, the need for development of a pricing policy, and the need for more interpretation in the evaluation data.
- Publicity efforts are cut back because of high system use.

June 1975 – August 1975 (Fourth Quarterly Report)

- Initiation of fee for service. No fee collection difficulties are experienced.
- Number of searches drops to 10% of previous free service searches.
- ACR completes analysis of first year of free operation.
- Cooper-DeWath time study to determine distribution of offline and online time is carried out for ACR.
- An additional day of training is provided to librarians.
- Project is expanded to four non-CIN libraries in other parts of the country using nonsubsidized search.

September 1975 – December 1975 (Fifth Quarterly Report)

- Oversight Committee meets and recommends that two terminals be subsidized for a third year of full-cost search operation, as requested by CIN libraries. However, the Committee expresses concern that continued external funding will delay a full assessment of nonsubsidized online search in the public library.
- Search activity increases from 115 last quarter to 187 searches this quarter (September, October, November).
- Newspaper advertisements produce little public response.

- An intensive mailing is sent to a community having a large number of professionals.

January – March 1976 (Sixth Quarterly Report)

- The number of searches shows a sharp increase for this quarter, from a total of 187 in the previous quarter to 254.
- Dr. Ahlgren of ACR visits the non-CIN libraries and reported on their characteristics.
- The search volume for the unsubsidized libraries proved to be extremely low.
- The response to the CIN mailing to a community with a large number of professionals proves to be quite low.
- A detailed review of searches is made by Lockheed during this quarter to determine common search errors.

June 1976

- Oversight Committee meets to review draft of Two-Year Report; recommends that third year of the study be devoted to providing a conceptual framework and to the evaluation of full-cost of online search to patron.

September 1976

- National Science Foundation approves a time extension for a third year of the study in accordance with the Oversight Committee recommendations.

Section 2
ONLINE REFERENCE RETRIEVAL

This section provides some background on online reference retrieval, and indicates the fee structure used in the DIALIB study.

2.1 DIALOG® RETRIEVAL SYSTEM

The Lockheed DIALOG Information Retrieval Service was used in the study. Over 36 data bases in science and technology, business, social science, and psychology are available, as shown in Fig. 2-1. An annotated search, indicating the sequence of operations used, is given in Fig. 2-2, and the DIALOG system is described in Appendix A. Although the DIALOG service was used, the results of the study should be applicable to any online search service that is accessible via telephone lines using standard terminals and offering a variety of data bases.

To perform a search, the user dials the telephone number of the search service and obtains a high-pitched tone indicating that the computer is available. The telephone handset is then inserted into the acoustic coupler which is part of the terminal. A message requesting the user password is printed out on the terminal. After the password is accepted, the user specifies the desired data base and then enters search terms via the keyboard. Search terms can be natural language (English) or numerical codes (such as product, event, or concept class codes) for some of the data bases. The user is aided in selection of search terms by being able to have terms displayed that are alphabetically close to an entered term. (For some data bases, terms that are conceptually close to an entered term can be displayed.) The system then indicates the number of document citations in the data base that contain the specified term(s), and supplies an identification number for this set of citations. Sets can then be combined using the AND, OR, NOT operators. Because of the command language used, and because knowledge of the data bases is required, a search intermediary who has been trained to use the system usually performs the actual search.

LOCKHEED INFORMATION SYSTEMS

DIALOG® INFORMATION RETRIEVAL SERVICE

Worldwide Access to Worldwide Knowledge

– OVER 12 MILLION CONTINUOUSLY AVAILABLE REFERENCES FROM WORLD'S PRINCIPAL DATA BASES –

SCIENCE

BIOSIS PREVIEWS ($65/hr) – Worldwide coverage of the life sciences (1972 to present).

- CA CONDENSATES ($45/hr) – Bibliographic data and keywords for chemistry and chemical engineering from Chemical Abstracts Service (CAS) (1972 to present).

CA SUBJECT INDEX ALERT ($60/hr) – Subject index headings and CAS Registry Numbers for CAS documents (1973 to present).

CA CHEMICAL NAME DICTIONARY ($60/hr) – CAS Registry Numbers, CA Index Names, and molecular formulas for CASIA.

- CAIN ($25/hr) – Worldwide coverage of agriculture from the National Agricultural Library (1970 to present).

COMPREHENSIVE DISSERTATION ABSTRACTS ($55/hr) – Doctoral dissertations from accredited universities (mostly U.S.) (1861 to present).

SCISEARCH® ($70/hr) – Index to the literature of science and technology from the Institute for Scientific Information (1974 to present).

SOCIAL SCIENCES

- AIM/ARM ($25/hr) – Abstracts of Instructional and Research materials (1967 to present).
- ERIC ($25/hr) – Complete data base of educational materials from the Educational Resources Information Center (1966 to present).
- EXCEPTIONAL CHILD EDUCATION ABSTRACTS ($25/hr) – Literature of education of handicapped and gifted children (1966 to present).

LANGUAGE AND LANGUAGE BEHAVIOR ABSTRACTS ($55/hr) – Coverage of speech and language pathology (1965 to present).

- PSYCHOLOGICAL ABSTRACTS ($50/hr) – Literature in psychology and other behavioral sciences (1967 to present).
- SOCIAL SCISEARCH® ($70/hr) – Multidisciplinary the social sciences (1972 to present).

SOCIOLOGICAL ABSTRACTS ($55/hr) – In-depth coverage of sociology and related areas (1963 to present).

TECHNOLOGY/ENGINEERING

CLAIMS™/CHEM ($150/hr) – U.S. chemical and chemically related patents plus some foreign equivalents (1950 to present).

CLAIMS™/GEM ($90/hr) – U.S. general, electrical, and mechanical patents (1975 to present).

- COMPENDEX ($65/hr) – Worldwide coverage of engineering literature from Engineering Index, Inc. (1972 to present).
- INSPEC-PHYSICS ($45/hr) – Worldwide coverage of physics from the Institution of Electrical Engineers (IEE) (1969 to present).
- INSPEC-ELEC/COMP ($45/hr) – Electrical engineering, computer science, and control engineering from IEE (1969 to present).

ISMEC ($45/hr) – Coverage of mechanical engineering and engineering management (1973 to present).

METADEX ($80/hr) – Coverage of metallurgical literature including Metals Abstracts Index and Alloys Index (1966 to present).

METEOROLOGICAL ABSTRACTS ($50/hr) – Worldwide meteorological and geoastrophysical literature (1972 to present).

- NTIS ($35/hr) – Complete Government Reports Announcements data base covering government research from over 240 agencies (1964 to present).

OCEANIC ABSTRACTS•(1)($55/hr) – Coverage of worldwide oceanography and marine-related literature (1964 to present).

WORLD ALUMINUM ABSTRACTS ($50/hr) – Coverage of technical literature ranging from ore processing to end use (1968 to present).

BUSINESS/ECONOMICS

- ABI/INFORM ($65/hr) – Coverage of business, finance, and related fields (1971 to present).

CHEMICAL INDUSTRY NOTES ($90/hr) – Coverage of the chemical process industries from Predicasts, Inc., and CAS (1973 to present).

FOUNDATION DIRECTORY ($60/hr) – Descriptions of over 3500 foundations from the Foundation Center (maintained on current basis).

FOUNDATION GRANTS INDEX ($60/hr) – Cumulation of grants records from U.S. philanthropic foundations (1973 to present).

- PTS DOMESTIC STATISTICS ($90/hr) – Time series and forecasts on U.S. economics, demographics, finance, and production (1972 to present).
- PTS EIS PLANTS ($90/hr) – Data and classification of industrial plants in the U.S. (maintained on current basis).
- PTS F&S INDEXES ($90/hr) – Citations to articles relevant to business research (1972 to present).
- PTS INTERNATIONAL STATISTICS ($90/hr) – Time series and forecasts on foreign economics, demographics, finance, and production (1972 to present).
- PTS MARKET ABSTRACTS ($90/hr) – Worldwide coverage of Chemical Market Abstracts and Equipment Market Abstracts (1972 to present).
- PTS WEEKLY ($90/hr) – Current and extensive coverage of chemical and equipment market information; related to Market Abstracts File (1972 to present).

• Indicates data bases available at inception of study, June 1974.

Fig. 2-1 DIALOG Data Bases

Performing a DIALOG™ Search

The patron is interested in references to harmful food additives. The librarian selects the National Agricultural Library Data Base that has a Food and Nutrition file. The set of references pertinent to the term "food additives" is first selected. (There are 81 such citations.) Then sets pertinent to the terms "harmful," "dangerous," and "deleterious" are selected. (Sets 2, 3, and 4, respectively.) Finally, the librarian combines the sets by ANDing Set 1 with the set formed by ORing Sets 2, 3, and 4. The resulting Set 5 has 7 citations relevant to the concept "harmful food additives." The library has requested that these seven citations be typed out at the terminal, and one such citation is given below. The librarian could have requested that these citations be printed offline and mailed to the library. This is often done when many citations are to be printed.

```
YOU MAY ACCESS THE FOLLOWING FILES :
  1--ERIC THRU OCT.              10 --NAT.AGR.LIB/CA
  2 --ERIC 1972 -- E             11 --PSY. ABSTR. 19
  3 --CHEM ABST VOL              12 --INSPEC-PHYSICS
  4 --ERIC 1974 3 RD             13 --INSPEC-ELECT 7
  5 --(*NOT ONLINE*)             14 --INSPEC-COMPUTE
  6 --NTIS 1964-1974             15 --ABI DATA BASE
  7 --SOC SCISEARCH              16 --CMA-EMA
  8 --ENGR. INDEX 72             17 --CMA WEEKLY
  9 --AIM & ARM 1973             18 --F&S 1972
  ENTER NUMBER OF DESIRED FILE
  ? 10
        --- ----- -----------

? SELECT FOOD ADDITIVES
        1       81 FOOD ADDITIVES
? SELECT HARMFUL
        2      184 HARMFUL
? SELECT DANGEROUS
        3      129 DANGEROUS
? SELECT DELETERIOUS
        4       14 DELETERIOUS
? COMBINE 1 AND (2 OR 3 OR 4)
        5        7  1 AND (2 OR 3 OR 4)
? TYPE 5/2/1-7

TX533.M37.F&N   ID NO.-73-9364380     001650
  FOOD POLLUTION; THE VIOLATION OF OUR INNER ECOLOGY
  MARINE, GENE; VAN ALLEN, JUDITH
  NEW YORK, HOLT, RINEHART AND WINSTON   385 P.   1972
  DESCRIPTORS- ADDITIVES AND ADULTERANTS, FOOD-RELATED DISORDERS,
FOOD STANDARDS AND LEGISLATION, PESTICIDE RESIDUES, FOOD TECHNOLOGY,
FOOD AND DRUG ADMINISTRATION, CANCER, FOOD FADS, FOOD ADDITIVES
```

Fig. 2-2 Typical DIALOG Search

2.2 SEARCH FEES

As indicated previously, the participating libraries chose to pass the cost of searching on to the patron during the second year pay period. We will not discuss the pros and cons of fee for service in the public library; the interested reader is referred to Ref. 2 and to Appendix E of Annex 1. For an analysis of the cost of online searching, see Appendix F of Annex 1.

2.2.1 Fee Structure

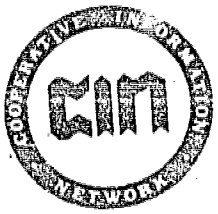
There is no fixed monthly cost associated with subscribing to the DIALOG system. Instead, search cost is computed on the basis of "connect time," the actual clock time that the user is connected to the system. This connect time cost varies from data base to data base, as was indicated in Fig. 1-2.

Because they were concerned about the cost of search to the patron, the participating librarians requested that an alternative fee structure be provided for the experiment - a structure that did not depend on connect time. Therefore, two different fee structures were offered to the participants, a "custom search" that had no limitations, and which was based on one-half the usual connect time costs, and a special "standard search" at a flat fee of $5 per search that was limited to a single data base and to 20 offline prints. Figure 2-3 shows a flyer that explained these two types of search to the public.

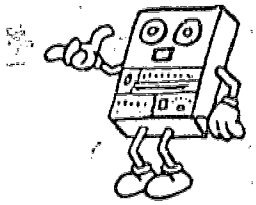
Contrary to our expectations, the standard search was used only a small fraction of the time. Two possible factors that led to this light use were (1) the ability of performing a custom search in the low cost data bases such as ERIC at less than $5, and (2) the restriction to a single data base was found to be too confining.

2.2.2 Mechanics of Fee Collection

Fears were expressed that the libraries would encounter much difficulty in fee collection, both because of refusal of a patron to pay the balance of the fee due to dissatisfaction with the results, as well as by patrons who fail to pick up their results



DIALOG



COMPUTERIZED INFORMATION RETRIEVAL

DOES YOUR REFERENCE QUESTION REQUIRE MORE THAN A STANDARD, MANUAL LIBRARY SEARCH ?

Perhaps a computerized search will find what you are looking for in the field of education, agriculture, psychology, science, engineering, or business.

For your convenience, the following plans are available:

1. Standard Search

   A search will be conducted in one data base. There is a limit of ten sets and 20 printed citations. It is suggested that it be used to search a limited subject or to search a subject on a preliminary basis, prior to setting up a custom search

   Cost: $5.00

2. Custom Search

   This search can be as extensive as necessary to fully examine the material available on the subject.

   Cost: A $5.00 deposit is required for all custom searches, and the balance is payable on completion of the search, or at the time the off-line prints are picked up.

This system will compile a sizable bibliography for you if the subject is currently of great interest or if it has been heavily researched.

If your particular subject is rare or unexplored, the computer may seek in vain. Perhaps it will not call up a single citation.

Too much

JUST RIGHT

Not enough

Please remember, if we search and find nothing....there is still a charge. If you chose a custom search, it might be costly. So please, for your budget's sake, and our peace of mind, discuss your plans with the librarian before any search is initiated. Then perhaps, we'll all communicate happily forever after.

See sample on other side.

Brought to you by: Cooperative Information Network
Lockheed Information Systems and the National Science Foundation

Fig. 2-3 Flyer Explaining Fee Search to Patron

their results and to pay the balance due. For this reason, a contract-like form was prepared and used, as shown in Fig. 2-4.* In addition, a procedure was established so that a disgruntled patron could obtain a refund if the search was forwarded to Lockheed for analysis, and it was found that the search had indeed been incorrectly performed. (The library would refund the money to the patron and Lockheed would credit the library's account for that amount.)

In actuality, there were no requests for refunds and no defaults by the patron. It surprised the librarians to have some of the patrons indicate that they thought that the search would cost even more. (See Appendix B for some librarian comments concerning fees and the collection.) None of the libraries used bank credit card operation, but several established accounts for several repeat users.

2.3 IMPACT OF FEE ON SEARCH VOLUME

The impact of fee for service on search volume is shown in Fig. 2-5. Note that the search volume rose during the free period from 55 searches in September 1975 to approximately 300 in May 1975, for the four CIN libraries. In June 1975, when fee service was initiated, the search volume dropped precipitously to 29 searches, and rose during the year until 77 searches were performed in May 1976.

*The procedures used in fee collection at the San Jose Public Library are detailed in Appendix F.

SAN JOSE PUBLIC LIBRARY

DIALOG SEARCH AGREEMENT

DIALOG makes it possible to search a large number of documents, periodical articles, and research reports and compile a bibliography on a concise subject. DIALOG is not designed to provide answers to specific questions. The results of a search are largely dependent on the conciseness of the definition of subject matter desired and the keywords or phrases chosen by the patron to describe it.

Two types of DIALOG searches are available:

STANDARD SEARCH

Cost: $5.00 prepaid.

Conditions: Search will be conducted in one data base.
A limit of ten sets can be formed.
A limit of twenty citations can be printed on-line.
Additional off-line citations can be printed at five cents per citation.

CUSTOM SEARCH

Cost: $5.00 deposit must be paid on all custom searches. The balance is payable on completion of the search or at the time the off-line prints are picked up. The charge will be fifty percent of DIALOG's commercial rate

Conditions: Search can be extensive as necessary to fully search the subject.

I have conferred with a librarian and discussed search terms and strategy. I understand that a cost will be incurred whether the search is successful or not and agree to compensate the Library for such costs. I have read the "DIALOG Search Agreement" and request that the San Jose Public Library perform a _____ search.

Date: _____ Signature _____

	AMOUNT	DATE	RECEIPT #
Standard Search	_____	_____	_____
Off-line Prints ___ @ ___	_____		
Custom On-Line Cost	_____		
Custom Search Total	_____		
Custom Search Deposit	_____	_____	_____
Staff and Connect Time	n/c		
Balance Due	_____	_____	_____

Search Number _____ Librarian _____

(Please make check payable to the San Jose Public Library)

Fig. 2-4 Typical Fee for Search Agreement

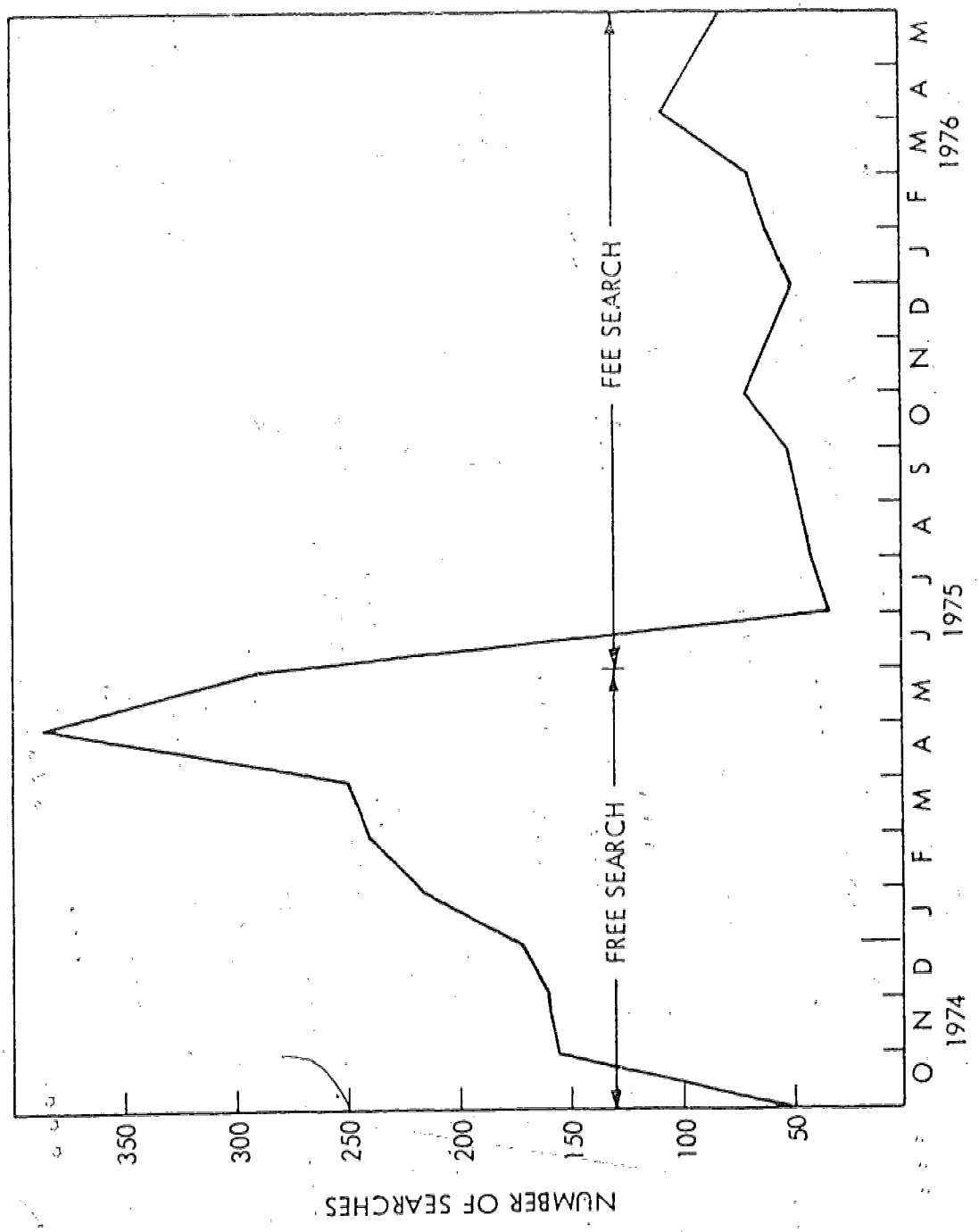


Fig. 2-5 Total Monthly Searches Performed by CIN Libraries

Section 3
EVALUATION SUMMARY

One of the principal purposes of the evaluation conducted by Applied Communication Research was to provide public library administrators with data which would allow them to make decisions about the utility of providing an online search service through the public library and to determine what the cost of such a service would be. To accomplish this purpose, case studies covering the 2-year period of the experiment were completed for each of the four Project DIALIB libraries.

These case studies actually cover two different approaches, by each of four libraries, to the provision of online search services. In effect, then, the evaluation is based on eight case studies. These studies look at the effects of offering online services to patrons first at no cost (referred to as the "free period") and subsequently at half-cost (referred to as the "pay period") through each of the Project DIALIB libraries. (Evaluation of a full-pay period is now in progress.) In addition, the evaluation compares differences in online system operation between each of the four Project DIALIB libraries for both time periods.

Data for the case studies were collected through four major instruments: computer command summary sheets; search request forms completed by both the patron at the time of the search request and by the librarian upon completion of the search; follow-up questionnaires completed by patrons after receipt of the results of the search; and interviews with working librarians, head reference librarians, and library administrators.

The evaluation was aimed along three major dimensions: descriptive analysis of actual searches; analysis of usage patterns and user characteristics; and analysis of library impact. Search statistics included information on search costs, staff time devoted to online searching, location of source documents, and time to complete

the search. Usage patterns and user characteristics included information on user occupations, reasons for search, level of education, type of question, value of search to patron, number of useful citations, and source through which patron heard about the availability of the online service. Library impact analysis included an assessment of the impact of an online service on the reference service, the reference librarian, library policy, and the community served by the library. Changes which occurred within each evaluation dimension between the free and pay periods were also identified and discussed.

In addition, differences in online service operation and use between Project DIALIB libraries were identified and discussed. During both the free period and the pay period, libraries differed in number of searches conducted, average search time, and average number of online and offline citations printed. Interlibrary differences were also noted in patron occupation, reason for search, the method through which the patron heard about the availability of the service, the value of the search to the patron, and patron responses to a question asking if the results of the search provided sufficient references to answer their question adequately. There were also noticeable variations between libraries in terms of client availability at the time of the search and in the time which elapsed between submission of the search request by the patron and subsequent receipt of the search results. To assist in explaining some of these observed differences, profiles of each library were compiled, based on interviews with reference librarians.

For a complete discussion of interlibrary differences, the reader is referred to Chapter IV, Annex 1, of the Interim Report. Reasons for differences, which are highly speculative, are not summarized in this section.

The following evaluation material only highlights some of the data collected during the course of the evaluation. For complete information on all aspects of the evaluation, the reader is referred to Annex 1 of the Interim Report.

3.1 SEARCH STATISTICS

- How many searches were performed?

A total of 1920 searches were completed by the four libraries during the free period. As expected, the number of search requests dropped precipitously in June 1975 when charges were introduced. However, the total number of searches being conducted each month during the pay period increased from a low of 19 in June, 1975 to a high of 103 by March, 1976 and dropped back to 69 in May, 1976. By the end of the pay period, a total of 747 searches had been completed.

- What was the average search time?

Searches conducted during the free period required an average of 22 minutes per search. However, average search times decreased steadily over the 9-month free period, dropping from a high of 31.28 minutes in September 1974 to 18.69 minutes in May 1975. The average search time for custom searches completed during the pay period dropped to 15.90 minutes.

- How many citations were located?

During the free period, an average of 14.27 online citations and 55.83 offline citations were printed per search. During the pay period, the average number of online citations printed per search dropped to 3.42 while the average number of offline citations printed per search increased to 88.89.

- What were the most popular data bases?

The five most frequently used data bases during both the free and pay periods were ERIC, NTIS, Psychological Abstracts, Social Science Citations, and Engineering Index.

- How much offline staff time is required per search?

Offline preparation time (per search) varied widely both between time periods and between libraries. Librarians estimated that they spent more time offline preparing for a search during the pay period than they did during the free period. In fact,

during the free period, 45.7% of all searches involved no offline preparation time as opposed to 19.3% of all searches conducted during the pay period. The percentage of searches requiring from 15 to 25 minutes of offline time nearly doubled (17.3% to 33.6%) during the pay period. The percentage of searches requiring from 30 to 35 minutes of offline time nearly tripled (5.6% to 14.3%) during the pay period.

- What is the average cost of an online search?

The average search conducted during the free period cost from $14.80 to $24.10, not including staff time or fixed expenses. A detailed time/cost study of online searching was completed during the free period (see Appendix F, Annex 1). The results of this study indicate that the average cost of a search completed during the free period was $28.41. This cost includes online and offline staff time, online search time, and offline citations printed (telephone line charges are not included). About 20% of this total cost is staff time. The total cost of the average custom search completed during the pay period ranged from $9.33 to $20.56 (patrons paid one-half of these costs). In fact, the cost to the patron was less than $10.00 for 61% of all searches completed during the pay period. (Note: During the pay period, patrons were charged one-half the cost of online search time plus offline ciations printed.)

- How long did it take to receive search results?

During the free period, 50% of online service patrons received the results of their searches in 1 week or less (from the time the search request was submitted). About 79% of online service patrons received the results of their searches in 1 week or less during the pay period. Although there were differences between libraries in turnaround time, generally the time which elapsed before the patron received results was reduced at all libraries during the pay period.

- What Sources Are Used to Obtain Documents?

Patrons used a wide variety of sources to obtain documents cited in search results. College libraries were the major source; 33% of search patrons during the free period and about 46% of patrons during the pay period obtained one or more documents from college libraries. About 30% of patrons during the free period and 22% of

patrons during the pay period obtained some documents from the library at which the search was conducted. Various other sources, including publishers, NTIS, company libraries, and departmental libraries of the State of California also provided patrons with documents.

3.2 USAGE PATTERNS AND USER CHARACTERISTICS

- Who are the users?

The principal user groups are graduate students, educators (including teachers, professors and school administrators), technical professionals (including civil, nuclear, and electronic engineers, geologists, and computer specialists), and librarians. These four groups accounted for 48% of all users during the free period and for about 56% of all users during the pay period. The most notable change between the free and pay periods occurred in the college (undergraduate) student category. Use by college students dropped from about 13% during the free period to about 9% during the pay period. About 68% of all search patrons during the free period and 57% of all patrons during the pay period had completed some graduate work or held advanced degrees (M.S., M.B.A., Ph.D., M.D., etc.).

- How do patrons hear about the availability of the service?

The major publicity sources during both the free and pay periods were librarians and friends. During the pay period, professors replaced library notices and newspaper sources as the third most frequently cited source and library notices replaced newspaper sources as the fourth most frequently cited source.

- Why did users request an online search?

Most online searches were requested as either part of the patron's job or for research papers. About 33% of all searches, during the free and pay periods, were requested as part of the patron's job. About 33% of all searches completed during the free period and about 43% during the pay period were done for research papers.

- What were the search topic areas?

The types of questions asked by users were highly complex dealing with a wide variety of subjects including psychology, education, engineering/science, biology/medicine, social services, and agriculture. A comparison of online search questions and typical small public library reference questions indicates that online search questions are far more technical and complex than the types of questions normally asked of a reference librarian in a small public library.

- Did patrons find the search worthwhile?

During the free period, 53% of online service patrons stated that the results of their search provided sufficient references to answer their question adequately. During the pay period, this percentage increased to almost 60%. The number of citations actually of use to the patron also increased during the pay period. Only about 13% of patrons during the pay period indicated that no useful citations were received,* as opposed to almost 18% of patrons during the free period. Also, nearly 21% of patrons during the pay period indicated that from 21 to 50 citations were of use to them (an increase of almost 11% over the free period). The largest percentage of patrons (about 30% for both the free and pay periods) indicated that from 1 to 5 citations were actually of use to them. About 70% of patrons during both periods indicated that the results of their search were of much value.

- Are users regular public library patrons?

Approximately 90% of search patrons hold cards at one of the 150 libraries in the Cooperative Information Network. However, only 36% of online service patrons during the free period and only 30% of patrons during the pay period hold cards at one of the four libraries conducting searches. About 60% of online service patrons indicated that they normally used the reference service at a public library only several times a year or infrequently. Only 7% of online service patrons use the reference service on a daily or weekly basis.

*It should be noted that for some types of search, e.g., patents, Ph.D. dissertation proposals, etc., no useful citations is a positive result.

- Will patrons use the service in the future?

During the free period, about 26% of patrons indicated they would use an online service at least monthly. Another 67% indicated that such a service would be useful several times a year. During the pay period, about 80% of online service patrons indicated that the service would be useful to them several times a year. Approximately 10% indicated that the service would be useful either monthly or more often, half of the users stated that the results of their search suggested additional questions of interest to them.

3.3 LIBRARY IMPACT

The introduction of computerized search services has had little overall impact on the libraries participating in the experiment (at least, not within the 2-year study period). Provision of the online service did, however, have a substantial impact on reference service staff responsible for conducting searches. The entire search process including query negotiation with the patron, offline preparation time, online search time, relaying search results to the patron, location of source documents, and billing (during the pay period) required substantial amounts of staff time. In addition, individual staff members spent a great deal of time, initially, learning system operation and data-base organization. DIALOG operators continue to spend time maintaining and improving their online expertise and learning new data bases. Each of these factors is discussed more fully in the following section. The effect of the online service on library policy and administration generally was less noticeable at this point in the project.

3.3.1 Impact on Reference Service

The major impact of the new service was the increased work load and the accompanying stress imposed on the reference staff. No extra staffing (with one minor exception) was provided for the project at any of the libraries. There are a number of factors which have contributed to the high demand on staff time:

- By the end of the free period, the libraries were averaging about 90 searches per month, requiring from 20 to 30 minutes per search of online time. In addition, about 44% of all searches completed during the free period required

from 5 to 25 minutes of offline preparation time and another 10% required from 30 to 90 minutes.* By the end of the pay period, libraries were averaging about 24 searches per month, requiring from 16 to 18 minutes per search of online time. For all searches completed during the pay period, about 50% required from 5 to 25 minutes of offline preparation time and about 30% required from 30 to 90 minutes of offline preparation time.

- Each search also required fairly extensive interaction between the librarian and the patron. Search request negotiations frequently involved lengthy explanations of the search process by the librarian.*
- The location of source documents upon completion of the search is another, and usual, potential demand on staff time. In the case of Project DIALIB, this has not proved to be a major difficulty.
- Staff were also responsible for calculating search costs during the pay period. However, the introduction of online printout of search costs (which Lockheed has now implemented) should eliminate this accounting task.
- The introduction of computerized search services has also increased patronage of the reference service at the libraries participating in the experiment (see the section on Search Statistics). However, most of these patrons are from outside the normal "service area" of the libraries providing DIALOG searches. In addition, librarians feel that most of these new patrons come into the public library only to use the online service.
- The heavy demand for demonstrations of the service has also required a great deal of staff time.

3.3.2 Impact on Reference Librarian

The online search service has also had an effect on individual librarians who conduct searches.

*This is typical of manual indepth reference work.

- Individual librarians are responsible for negotiating search requests, for conducting searches, and for maintaining a certain level of familiarity with the actual operation of the system.
- Librarians are responsible for learning the organization and content of new data bases added to the system and for maintaining proficiency in searching data bases; just as is necessary with hard copy reference tools. Most staff felt that the diversity and range of subjects covered in online search requests posted a problem unique to the reference staff of small public libraries. Reference librarians need to be skilled in searching some 30 to 40 data bases to handle such subject diversity (although library service policies could restrict searches to a limited number of bases).
- Reference librarians have indicated that the use of computerized search services gives them a new feeling of competence in dealing with technical reference questions that they would have been unable to answer without the service. They have also indicated that use of the system has been a highly educational experience.

3.3.3 Impact on Library Policy

The third major impact on the library depends on the policy the library adopts to cover the cost of the service. Project DIALIB libraries have chosen, during the pay period, to pass half the cost of online search time plus the cost of printing offline citations on to the patron.* However, a number of alternatives are available.

- If a library decides to include the cost in their current budget and continues to provide free searches, this could have some effect on library policy. Administrators should keep in mind that provision of a free online service cuts into the funds and staff time available for the establishment and/or operation of other services. The heavy demand for free searches would certainly necessitate either the hiring of additional staff to conduct computer searches or the establishment of a policy that would limit system use according to some criterion determined by the administration.

*The NSF grant pays for the other half.

- Should a library decide to pass some portion or all of the cost of the service on to the patron, there could be some impact due to the need for a structure capable of dealing with billing and fee collection. The "cash and carry" policy adopted by the libraries during the pay period seems to have had little effect on general library operations. The main impact of the policy was to increase the time demands on reference staff, as certain staff members were responsible for calculating search costs.
- Provision of fee-for-service computer searches may also require some rather important policy decisions. For instance, the library must determine if all patrons will be charged uniformly for the service or if patrons will be charged on a scale based on ability to pay. (Most public librarians seem to feel that the second alternative is not feasible for a public library.) If the library decides that the user should pay for the service, it must also decide if the patron should only pay for the cost of connect time to the data bases used in the search and for the cost of citations printed offline, or if an additional fee should be charged to cover staff time, communication, and equipment costs.

3.3.4 Impact on the Community

Although online service has attracted patrons to the public library reference service, most of these patrons are from outside the community in which the search library is located (36% had cards at the library at which the search was performed, 54% had cards elsewhere, and 10% did not have a library card).

Still, on a small scale, online service patrons have been introduced to new services and have expressed greater awareness and appreciation of new information technology and of the innovativeness of the public library. Once patrons utilize the service, they are quick to suggest a wide variety of additional data bases that they would like to see made available through the computer.

Online search services do have the potential of providing reference support services to municipal government. However, this potential has not been realized during the 2 years of Project DIALIB. During the first year of the project, the city manager of Redwood City stated (for the first time) that one of the services which the public library could provide was "back-up research for local government officials." And, in fact, some municipal agencies did pose a number of technical questions to Project DIALIB librarians on subjects such as helicopter noise levels, redevelopment financing, patrol car maintenance, open channel flow of storm waters, and solar energy. However, the full potential certainly has not been realized as of the end of the second year of Project DIALIB. Project DIALIB librarians at three libraries* were disappointed and discouraged about the lack of response from both municipal agencies and municipal government officials to the availability of the service. Several of the libraries made special efforts to provide municipal agencies with demonstrations of the online service. The Santa Clara County Library, in addition to demonstrations, provided a fixed sum of money to cover searches requested by municipal agencies, but municipal agencies made little use of the service.

Thus, provision of an online service has had very little impact on the communities served by the participating libraries, at least not on a short-term basis. The potential for a substantial impact remains, particularly if some of the additional data bases requested are made available. However, as in the introduction of almost all innovations, any observable impact will probably be accomplished only after a long, painstaking process involving education of both the public librarian and the public.

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*The San Jose library found a growing use of the municipal reference service.

Section 4
CONCLUSIONS

One of the principal purposes of the evaluation conducted by Applied Communication Research, as stated in Section 1, was to provide public library administrators with data which would allow them to make decisions about the utility of providing an online search service through the public library and to determine what the cost of such a service would be. The data in Section 3 were thus presented with the objectives of providing administrators with the kind of information that would be useful in planning for an online service under two different funding situations. No attempt will be made to summarize such specific data on users, usage patterns, and search costs in this section.

Instead, this section contains general conclusions suggested by the evaluation data and a number of pertinent observations derived from the entire Project DIALIB experience. It should be noted that most of the following points are subjective judgments based on a combination of observation, "hard" data, and extensive interviews with project participants. Apparent causal relationships cannot be verified using data obtained in a highly uncontrolled, case-study approach. Although most observations cannot be verified, they are still important both as indicators of factors which may affect the success or failure of an online search service offered within a public library context and as indicators for future research.

It also should be noted that the impact of online search on a public library familiar with the requirements of indepth reference search will be different than on a small public library having minimal reference capabilities. We have tried to make this distinction clear in these conclusions.

(1) The public library can be an effective channel through which to provide an online service. (Which is not to say that public libraries are the most effective channel — the data cannot support such speculation.) Project DIALIB libraries averaged 90 searches per month during the free period and 24 searches per month during the pay period. Also, about 70% of online service patrons during both periods felt that the results of their search were of much value.

(2) Public libaries are not all equally well suited to provide online search services. At this time, online services are useful mainly to patrons needing information indepth. The principal users are primarily educationally sophisticated professionals. Thus, areas with a high concentration of individuals falling into the principal user categories provide the best "markets" for online services. Public libraries serving such areas would certainly find more demand for an online service than would public libraries located in areas with a low percentage of "information literates." The most effective service (in terms of high volume and rapid turnover) seems to be provided through those main libraries that are easily accessible and that have a high potential for direct contact (either by phone or through "walk-in" trade) with patrons requesting online searches. In contrast, a library which is not easily accessible, which has little direct contact with patrons, and which would probably receive the majority of online search requests via branch libraries, would probably be less effective.

(3) A public library interested in operating an online service should be aware of existing services which may be available to the public. If adequate services already exist to supply the information needs of user groups, the public library may not wish to enter into "competition" with such services.

(4) If an online service is readily available at the public library, a market does exist for the service. data indicate that online system patrons are not frequent users for the public library reference service. Instead, they are highly educated professionals and students from a number of varied disciplines who do not normally consider the reference service at a small public library a source of indepth information. The majority of questions asked by these online service patrons are

highly technical and complex. Reference librarians at the public libraries participating in Project DIALIB indicated that they would not be able to answer such questions without the assistance of an online service.

(5) The initial provision of free searches to patrons, along with an active publicity campaign, seems to have had a strong impact on search volume. The four Project DIALIB libraries completed nearly 1,000 free searches during the first 6 months of operation. In contrast, libraries providing full-cost service to patrons (see Appendix D of Annex 1) without an initial free period or attendant publicity campaign indicate a relatively low volume of search requests. The available data do not allow a determination of the relative importance of these variables (free search period, publicity campaign) either individually or in combination.

(6) The allocation of reference service staff time is one of the most important factors to be considered in planning an online search service. As indicated earlier, public librarians in small public libraries do not normally perform indepth reference searching on the types of technical questions submitted by online service patrons. Computer searching on such questions and related tasks are too time consuming to be simply added on to such a public librarian's reference duties. If such a service is added without proper provision for staff time, other reference duties and/or services may suffer from neglect. In addition, inadequate staff time for an online service adversely affects search volume and turnaround time. Overworked staff are also more likely to be hostile toward the introduction and subsequent operation of a new service.

(7) To maintain search proficiency, online searchers must complete some "critical mass" of searches each month in each data base for which proficiency is desired. (It is not possible to determine optimal upper and lower limits on this critical mass from the available data.) Project DIALIB searchers who completed relatively few searches in one month felt less competent at online searching than did more prolific searchers. They felt that "hands-on" experience was required to maintain familiarity with data base organization, optimal search strategies, and data base content. On the other hand, a librarian overloaded with an exorbitant number of

searches in 1 month may find that time limitations imposed at all stages of the search process (including query negotiation, online search time, and relaying of citations to the patron) may affect search quality.

(8) The problem of maintaining familiarity with all data bases is one of the most difficult problems faced by reference librarians conducting online searches. Project DIALIB librarians, who assumed responsibility for conducting searches in all data bases, felt generally that their search competence increased with data base familiarity. The proliferation of data bases makes it extremely difficult for one person to maintain a thorough knowledge of each new data base. Project DIALIB librarians felt that, like the hard copy reference tools, many data bases have a relatively unique organization and content, and that significantly compounds the problem. There are two possible approaches which may help to alleviate this problem. An organizational approach would be to make each reference librarian responsible for maintaining expertise on a limited number of data bases rather than trying to cope with all of them. Project DIALIB librarians did not use this approach because reference librarians work in shifts (an "expert" in a particular data base might not be on duty when needed for a particular search), and particular "experts" would be unavailable while on vacation. A training approach would be to develop better instructional materials describing the organization, content, relevant keywords, and optimal search strategies for each data base. The absence of such instructional materials was one of the most persistent complaints expressed by Project DIALIB librarians.

(9) The amount and quality of general training in online system operation may also affect the successful operation of the service. Most searchers believed that the initial training sessions alone were not sufficient for optimal system utilization. They felt that either additional training sessions were required after searchers gained familiarity with system operation or that training manuals should be made available to assist searchers as they gain expertise. Almost all staff felt that better searcher-oriented instructional materials for DIALOG should be developed.

(10) The attitude of the head reference librarian toward the service seems to have had a substantial impact on the speed and efficiency with which searches were completed. Librarians at all libraries found that provision of an online search service imposed additional demands on their time. However, at those libraries at which head reference librarians had a strong positive attitude toward the service, more searches were completed and were done in less time than at libraries where this attitude was missing.

(11) The major effect of the shift from a free to a fee-based service was a reduction in the volume of search requests. (Current trends indicate, however, a steady increase in search volume during the pay period.) Some shift was also observed in the allocation of staff time to various steps in the search process. During the pay period, staff attempted to reduce connect time (and subsequently the cost of the search to the patron) by spending more time offline preparing for the search.

(12) Finally, the provision of an online search service has done little in the short-term to alter the image of the public library in the community it serves. The principal impact of the service has been on professionals in both business and industry and on college students, all of whom have been particularly impressed by this new service being offered through the public library. These users seem to view the public library as being more innovative and progressive than they had considered it to be prior to the implementation of the online service. Most municipal government officials have taken only cursory notice of the public libraries providing online search services. In spite of considerable effort on the part of DIALIB librarians to provide government agencies with demonstrations and/or free searches (even during the pay period), a few such agencies actually made use of the service. However, government agencies in San Jose did make use of the service and at least one government official did note that a public library might be capable of providing support reference services for government agencies.

* * *

The process of changing an image or increasing public awareness of the role or function of the public library is a long, slow process. It is certainly much too

soon to suggest what the long-range impact of an online service might be on either the public library or the community. In particular, one of the key questions remains unanswered: Can online search sustain itself in the public library after all subsidies have ended? The final report to be produced in the Fall of 1977 will be of particular interest, since it will cover not only the June 1976 – May 1977 period in which the only subsidy was the terminal rental, but will also indicate what happens when the terminal subsidy is removed.

Section 5
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Appendix A

DIALOG INTERACTIVE INFORMATION RETRIEVAL SYSTEM

DIALOG INTERACTIVE INFORMATION RETRIEVAL SYSTEM

by R. K. Summit

Reprinted from Encyclopedia of Library and Information Science

LOCKHEED PALO ALTO RESEARCH LABORATORY
LOCKHEED MISSILES & SPACE COMPANY, INC.
A SUBSIDIARY OF LOCKHEED AIRCRAFT CORPORATION

DIALOG INTERACTIVE INFORMATION RETRIEVAL SYSTEM

DIALOG is the name given to an interactive, computer-based information retrieval language developed at the Lockheed Palo Alto Research Laboratory. The DIALOG system consists of a series of computer programs which have been designed to make full use of direct access memory devices (in which data located anywhere on the device can be accessed in approximately the same amount of time) and video display units to provide the user a rapid and powerful means of identifying records within a file which satisfy a particular information need. By providing the user full display access to the indexing vocabulary, and the ability to modify search expressions, DIALOG becomes a data processing extension of the human operator who directs and controls the process according to his own personal needs. Figure 1 shows a DIALOG communications terminal which enables the user to communicate with the computer. The user issues commands to the computer by way of the keyboard, and he receives results on the display unit and/or on the teletype as appropriate. DIALOG allows the user with a well-defined search topic to proceed directly to desired records: the user who cannot so explicitly define his requirement is provided tools for browsing through the file. It is thus possible to investigate successive avenues of interest as they arise or are suggested by intermediate retrieval results.

The language procedures are easily learned, and the system has been used

FIGURE 1. *DIALOG communications terminal.*

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successfully by educators, working scientists, engineers, and librarians. To understand how such an information retrieval system operates, one should be aware of historical solutions to the problem of information retrieval and should have a general grasp of the techniques employed within a computer to accomplish on-line retrieval of information.

The central problem in information retrieval is to identify and obtain those documents from a collection that contain desired information. The magnitude of the problem becomes apparent when it is realized that many current technical collections require several miles of shelf space for storage. The user attempting to identify all documents that might discuss welding defects in aluminum or the use of molybdenum disulfide as a solid lubricant in spacecraft, for example, faces an almost insurmountable information retrieval problem.

The historical solution to this problem has been to create an index to the information collection. Indexes can take many forms. Back-of-the-book indexes assist the reader in finding which pages of a book discuss a particular topic. Library card catalogs are indexes that enable the library user to find information through several access points: subject, author, corporate source, report number, and other collective characteristics. Although useful, manual indexes are limited in several ways. The more specific the indexing, the larger the index becomes, and the harder it is to find particular topics of interest in the index. Consequently, manual indexes usually contain only relatively general subject headings which apply to large numbers of documents. As a result, after finding a general topic of interest, the user still must scan a sometimes burdensome amount of material to identify specific items of interest. Another limitation inherent in manual indexes is the inability to combine or coordinate index elements into comprehensive groups. If one wishes to find what Stanford University has produced on the subject of teaching mathematics in the elementary grades, for example, the user has no way of combining the source entry point, Stanford University, with the subject entry points of mathematics and elementary education. Furthermore, there may be several source entries for Stanford University.

Computer-based information retrieval systems can largely overcome many of the limitations of manual systems if properly designed. In most cases computer-based retrieval systems not only allow the user to combine several retrieval parameters, but they also provide relatively rapid results. There are two major categories of computer retrieval systems, each of which approaches the retrieval problem in a somewhat different manner: serial search systems and direct access systems.

Serial search systems were the first to appear and were widely used during the early 1960s. With this approach, the collection or data base to be searched is normally contained on magnetic tape in serial fashion. Each record represents a document and contains the information elements found on a library catalog card (e.g., title, author, source, subject headings). To perform a search, a user fills out a form in which he describes as nearly as possible his interest. This search request is then coded by a person familiar with the collection and entered into the computer (usually along with several other search requests). The computer is controlled by a

relatively simple search program that causes it to read each successive record from magnetic tape, to compare the contents of the record with the elements specified in the search request, and then to copy the record out to a second magnetic tape if there has been a match, or to proceed to the next record. If the collection is large, it can take several hours for the computer to process the search requests. Furthermore, if the request has been too specific, the requestor is likely to get few if any results; if the specification has been too broad, the requestor can get several hundred citations printed out which he then must examine. Because the request had to be processed through an intermediary, there may have been further degradation in the quality of the results.

In direct access systems, indexes much like back-of-the-book indexes are constructed from the collection. For each index term or descriptor, the locations of all records in the collection containing that descriptor are listed on a direct access device. This index is commonly known as an inverted file. Whereas the book index indicates the locations of pages containing particular information, the inverted file indicates locations of records containing particular information. The main collection is also located on a direct access device. This file is commonly called the linear file. It is thus possible for the computer to look up a particular index term in the inverted file, to read off the list of locations or addresses for the citation records that contain the index term, and then to access directly the linear file for each location to copy the appropriate record—either to a display, as in the case of an on-line system, or to a printer, if this has been specified.

Whereas serial search systems can be efficiently operated only in a batch mode (i.e., each inquiry specifies the complete search process to be performed), direct access systems can be designed to be operated in either a batch or interactive mode (i.e., wherein the user can control and redirect the search process during execution). Typically, serial search systems are simpler and less costly to design but are more costly to operate than direct access systems. Direct access systems which provide for user interaction can typically produce higher quality results (i.e., a higher proportion of relevant results with fewer items missed).

Interactive systems can be further distinguished according to the rate and amount of information transferred during the search process. Systems designed for visual display terminals usually operate at relatively high speeds (120–240 characters per second) and transfer a larger amount of information but cost more to operate than teletype terminals, which operate at relatively slow speeds (10–15 characters per second).

It was decided from the outset that DIALOG was to provide maximum interaction between the user and the file. As a result, and even though relatively uneconomic at the time (1966), DIALOG was designed to include a terminal consisting of both a high-speed cathode ray tube display and an associated hard copy device (see Figure 1). From the user's point of view DIALOG consists of several plain English commands, such as DISPLAY, PRINT, and SELECT, which allow him to perform information retrieval functions. Commands are defined on the special characters above the numeric keys on the input keyboard so that a convenient command label

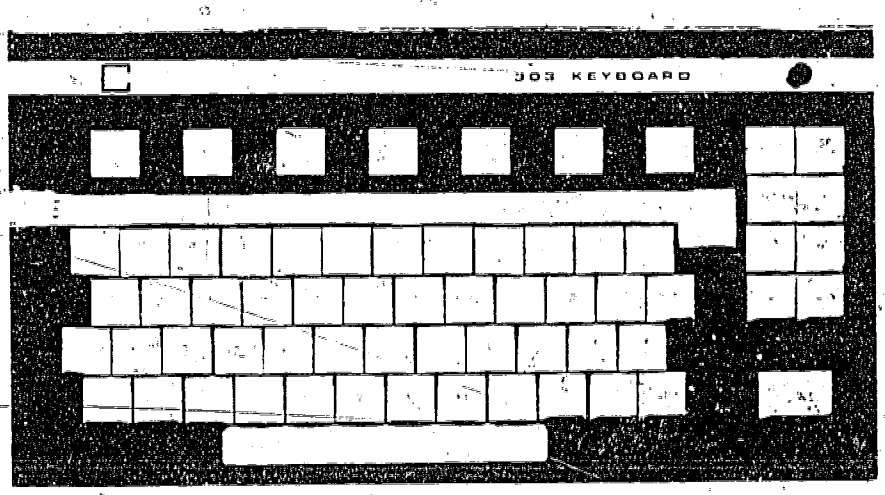

FIGURE 2. *DIALOG input keyboard with a command label strip.*

strip can be attached to the keyboard to identify the commands (see Figure 2). The commands are so designed that no prespecified sequence must be followed, i.e., the user is free to select any command he considers appropriate for the next step of the search. Consequently, the user completely controls the search process. At any point he can branch off the main path of his search to explore associated ideas suggested during the course of the search. The command key orientation results in a very simple clerical procedure: depress command key, key in operand data, press TRANS key to transfer the entire message to the computer. Corrections are made by backspacing and typing over incorrect characters. Following entry of each command, the system responds with information that assists the user in deciding the next step to take.

The final implication of the command orientation is that the search process is broken up into a sequence of small steps, each of which is very simple, and each of which results in feedback from the system. In this manner each step is completed correctly before proceeding, thus eliminating the need to reenter the entire search specification in case of an error, as must be done in batchtype systems.

In the context of these fundamental considerations, DIALOG design characteristics will be discussed with regard to six fundamental steps which are more or less followed in any retrieval process:

(1) Identify and select index terms which characterize the search interest.
(2) Coordinate individual terms into concept groups.
(3) Sample and evaluate intermediate search results.
(4) Modify (1) and/or (2) and redo (3).
(5) Output results.
(6) Review actual documents.

Machine implementation of each step will be compared with the historical solution in using the card catalog.

In using a card catalog, the searcher selects a generic noun or noun phrase related to his search interest and scans through the alphabetically arranged catalog entries looking for a match or a cross reference. If it is a large catalog, finding an acceptable entry can be time consuming. Most libraries do not provide a published catalog guide or index that would enable the searcher to identify subject headings of interest before approaching the card catalog.

In DIALOG, two commands, EXPAND and SELECT, are provided to assist the user in identifying and selecting desired index terms. One form of EXPAND provides a display of the alphabetically near index terms to the term entered together with an indication of the number of citations indexed by displayed terms, and also the number of cross reference or related terms associated with each displayed term. Figure 3 shows the display resulting from the command EXPAND "INTERACTION."† Each displayed term is numbered for easy reference. Another form of the EXPAND command allows the user to display the related terms in the same format as that just described (see Figure 4). The user is thus provided a window to the index and thesaurus to assist him in identifying useful index terms with which to characterize his search interest.

The SELECT command enables the user to construct a list of desired index terms for future reference. SELECT entries result in the definition of file subsets (referred to simply as sets) which are tagged with "set numbers" and are printed out on the terminal hard copy device.

The command, SELECT "COMPUTERS," for example, would result in the following output at the terminal:

Set No.	No. in set	Description of set (+=or, *=and, -=not)
1	558	COMPUTERS

Once selected a term (or more exactly, the file subset associated with the term) may be referenced by its set number. Citations associated with any set can be displayed, printed, selectively saved, or combined with other sets. If a selected term cannot be found, an error message is printed out for the user who then can automatically display the alphabetically near terms by depressing the EXPAND key. Each term is thus validated at time of entry, and the frequency of term use is recorded for later reference.

The card catalog contains a static collection of precoordinated subject headings (at least in the short run). Someone other than the searcher had to decide a priori the appropriate categories to be provided for retrieval. If categories are too broad, the searcher must manually examine a large number of citations to satisfy a specific

†Keyed entries by user are shown in quotation marks to distinguish them from command key entries.

EXPAND IT=INTERAC TION

REF	DESCRIPTOR	TP	CIT	RT
E01	IT=INTER INSTITUTIONAL PROGRAM DEVELOPMENT		1	
E02	IT=INTER ITEM CORRELATION COEFFICIENTS		1	
E03	IT=INTER NATION SIMULATION		2	
E04	IT=INTER-AMERICAN TESTS OF GENERAL ABILITY		1	
E05	IT=INTER-UNIVERSITY PROJECT ONE		3	
E06	IT=INTERACTION		282	9
E07	IT=INTERACTION ANALYSIS		2	1
E08	IT=INTERACTION ANALYSIS SCALE		1	
E09	IT=INTERACTION OF MATTER AND ENERGY		1	
E10	IT=INTERACTION PROCESS		1	

FIGURE 3. *Display of alphabetically near terms to "INTERACTION."*

subject interest. If categories are narrow, the number of catalog entries becomes unwieldly to use. In the traditional catalog, there is no way of combining categories at search time to provide broader or more specific categories.

In designing DIALOG, it was desired not only to provide the user a means of reviewing the citations within a particular category, but also to allow him to define dynamically his own categories by logically combining the results of several individual categories. This function was provided in the COMBINE command. With COMBINE the searcher can combine any number of citation sets in any logical manner. Continuing the above example, assume the user is interested in the interactive use of computers in information retrieval. He might go through the following steps:

Command entered	Terminal output: Set No.	No. in set	Description of set (+=or, *=and, −=not)
SELECT "COMPUTERS"	1	558	COMPUTERS
SELECT "INFORMATION RETRIEVAL"	2	441	INFORMATION RETRIEVAL
COMBINE "1*2"	3	72	1*2
SELECT "INTERACTION"	4	282	INTERACTION
SELECT "MAN MACHINE SYSTEMS"	5	93	MAN-MACHINE SYSTEMS
COMBINE "3*(4+5)"	6	17	1*2*(4+5)

In the above illustration, the user combined concepts of "COMPUTERS" and "INFORMATION RETRIEVAL" into a single category containing 72 items. He

EXPAND IT = INTERACTION

REF	DESCRIPTOR	TP	CIT	RT
R01	-IT=INTERACTION		282	9
R02	IT=INSTRUCTIONAL INTERACTION	1	2	1
R03	IT=RELATIONSHIP	3	80	30
R04	IT=AUDIENCE PARTICIPATION	4	14	3
R05	IT=INTERACTION PROCESS ANALYSIS	4	332	12
R06	IT=INTERGROUP RELATIONS	4	172	8
R07	IT=INTERMODE DIFFERENCES	4	22	5
R08	IT=INTERPERSONAL COMPETENCE	4	188	21
R09	IT=MAN MACHINE SYSTEMS	4	93	12
R10	IT=STATISTICAL ANALYSIS	4	768	24

FIGURE 4. *Display of related terms of "INTERACTION."*

decided that he could be more specific, and so he combined this result with a new concept made up of categories "INTERACTION" or "MAN MACHINE SYSTEMS" which were obtained from the display shown as Figure 4. This example can be developed as the cumulation of a series of very simple steps.

Scanning the titles of entries under a particular subject category in the traditional card catalog allows the user to select specific citations of interest. Frequently, however, other subject entry points for a particular item are not included on the catalog card, which denies the user the information he needs to explore other related areas of interest which might be suggested by the citation.

The DISPLAY command in DIALOG was designed to allow the user to review intermediate results. Of several formats available, that most frequently used provides a display of the entire citation including all assigned descriptors and a descriptive abstract if available (see Figure 5). Supplying the full citation not only enables the user to evaluate the relevancy of his search to that point, but it also shows him alternative descriptors he can explore or can include (using the COMBINE command) with other previously developed categories. Figure 6 shows the associated abstract that may also be displayed.

When the card catalog user finds relevant citations, he copies down their call numbers for use in obtaining the associated documents. If he wishes to develop a bibliography for future use or publication, he is relegated to copying manually the entire citation of each selected entry.

Two output commands are provided the DIALOG user which are identical except for the target device. PRINT outputs indicated sets of citations to the high-speed printer at the computer; TYPE similarly outputs to the low-speed terminal printer. Normally the user will output accession numbers to the local printer for use in obtaining hard copy and he will use the high-speed printer at the computer for the output of extensive bibliographies.

ED064431 EM007609
AN INTERACTIVE INFORMATION RETRIEVAL SYSTEM; CASE STUDIES ON THE USE OF DIALOG TO SEARCH THE ERIC DOCUMENT FILE.
TIMBIE, MICHELE; COOMBS, DON H.
STANFORD UNIV., CALIF. ERIC CLEARINGHOUSE ON EDUCATIONAL MEDIA AND TECHNOLOGY
RMQ66000
DEC 69
90P.
EDRS PRICE MF-$0.50 HC-$4.60
/COMPUTERS/ *EVALUATION/ *INFORMATION RETRIEVAL/ *INFORMATION SYSTEMS/ INFORMATION THEORY/ INPUT OUTPUT DEVICES/INQUIRY TRAINING/ INTERACTION/RESEARCH/ *SEARCH STRATEGIES/

FIGURE 5. *Display of full citation.*

At present most library collections are not available in machine-readable form. Provision has been made in DIALOG for each citation to be associated with a second record. This record can be an abstract or it can be the entire text of a document.

Of more practical interest at the present is interface to automatic microfilm equipment. DIALOG has been used with several of these devices, any of which can contain full document text.

In practice, DIALOG provides the user an easy-to-use command language that extends rather than replaces the concept of the traditional card catalog. DIALOG extends this concept by providing a means of combining subject categories and by providing the clerical facility for storing, cumulating, and printing desired citations in a variety of formats.

The initial application of DIALOG occurred early in 1967 when a DIALOG terminal was installed at the NASA Ames Research Center, Moffett Field, California. The system was used to conduct on-line searches of the NASA document citation collection which at that time numbered some 300,000 records. This data base was stored in a mass storage device at the Lockheed Palo Alto Research Laboratory, and communication was conducted over a telephone line. During this first application, DIALOG was used principally by engineers and scientists directly. During the second phase of the NASA application the terminal was relocated to NASA Headquarters in Washington, D.C. for 12 months. By this time the file had grown to 450,000 citations, the largest bibliographic collection of document citations searchable in an on-line, interactive mode. DIALOG was used principally by librarians during this second phase. Usage differences between the first and second phases were analyzed in a final report submitted to NASA (*1*).

Lockheed has recently completed a contract with NASA to develop and install a version of DIALOG known as NASA/RECON (Remote Console). NASA/RECON is currently in daily operation on a NASA computer servicing twenty-three terminals

ED034431
THE FIRST INTERACTIVE (ON-LINE) COMPUTERIZED USE OF THE ERIC FILES BY THE U.S. OFFICE OF EDUCATION IS REPORTED IN THE FORM OF AN EVALUATION OF THE DIALOG SYSTEM CONDUCTED AT THE ERIC CLEARINGHOUSE FOR EDUCATIONAL MEDIA AND TECHNOLOGY. DESCRIPTIONS OF THE PURPOSES OF THE STUDY OF THE DIALOG SYSTEM (DEVELOPED BY LOCKHEED MISSILES AND SPACE CO.), AND OF THE PROCEDURES INVOLVED IN CONDUCTING A SEARCH OF THE ERIC FILE USING DIALOG ARE FOLLOWED BY INFORMATION ON THE NINE PEOPLE, FROM VARIOUS AREAS OF EDUCATION, WHO WERE ASKED TO HELP EVALUATE THE SYSTEM. THE MAJOR PORTION OF THE REPORT, CONSISTING OF NINE CASE STUDIES, IS BASED ON THE REACTIONS OF THESE EVALUATORS (GATHERED IN DEBRIEFING INTERVIEWS) TO ONE OR MORE DIALOG SEARCHES WHICH THEY THEMSELVES CONDUCTED. IN ADDITION, 19 EVALUATIONS (BASED ON QUESTIONNAIRES FROM OTHER SYSTEM USERS) ARE PRESENTED. THESE, ALONG WITH THE NINE ORIGINAL EVALUATIONS, STRESS THE SPEED AND "HORIZON-WIDENING" EFFECT OF THE SYSTEM. A FINAL SECTION EXAMINES THE VARIETY OF USES FOR THE SYSTEM AT THE CLEARINGHOUSE. THE PRE-DIALOG QUESTIONS, THE DEBRIEFING OUTLINE, AND RECORDS OF THE EVALUATORS' SEARCHES ARE APPENDED.
(SP/MT)

FIGURE 6. *Example of displayable abstract.*

located in NASA facilities across the country. Lockheed installed and maintains another version of this system in Europe for the European Space Research Organization (ESRO). ESRO supports terminals in several European countries from a central computer facility in Germany (*2*).

During the past 2 years Lockheed has supplied remote terminal retrieval services to three Office of Education facilities with the Education Research Information Center (ERIC) files (*3*), and four Atomic Energy Commission facilities with *Nuclear Science Abstracts*.

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ROGER K. SUMMIT

Appendix B

COMMENTS FROM LIBRARIANS

FOREWORD

Comments regarding the DIALOG project were solicited from all the participating librarians. Comments were received from 14 individuals from a total of 7 libraries, both in written and tape-recorded form. The individuals are:

- Charlotte Sakai, Reference Librarian, San Jose Public Library, San Jose, California
- Bob Johnson, Reference Librarian, San Jose Public Library, San Jose, California
- Rob Luchessi, Reference Librarian, San Jose Public Library, San Jose, California
- Scotty McEwen, Reference Librarian, San Jose Public Library, San Jose, California
- Nancy DeWath, Reference Librarian, San Mateo County Library, Belmont, California
- Judith Neufeld, Assistant to the Director, Long Island Library Resources Council, Inc., Bellport, New York
- Ann Landtroop, Head of Business, Science, and Technology Department, Houston, Texas
- Carol Vantine, INFORM Librarian, Minneapolis Public Library, Minneapolis, Minnesota
- Lois Thomas, Head, Research Center, Santa Clara County Library, Cupertino, California
- Dale Thompson, Regional Librarian, Santa Clara County Library, Cupertino, California
- Alison Holtby, Reference Librarian, Santa Clara County Library, Cupertino, California
- Charlotte Doudell, Reference Librarian, Santa Clara County Library, Cupertino, California
- Eric Kristofferson, Reference Librarian, Santa Clara County Library, Cupertino, California
- Lisa Naef, Head, Adult Reference and Readers' Advisory Service, Redwood City Public Library, Redwood City, California

These comments have not been edited, but have been organized into topic areas, based on suggestions by Nancy H. Knight. It is hoped that the actual words of the participants will provide some of the flavor of the experience.

B.1 EFFECTS OF ONLINE SEARCH ON LIBRARY IMAGE

Librarians suffer from a bad image problem. We find people surprised that a librarian can access information without knowing much about the subject. I am pleased as to what online searching does for the image of the librarian. Online search is a strong selling point which shows people that the librarian is dealing with information in a modern way.

I have found the experiment to be totally satisfactory in enabling me to educate information users as to why an understanding of the organization of information is important, and why it should be done by a professional, as well as a subject specialist. It has really given a polish to the librarian's image in the eyes of business and scientific people.

The business community initially has some difficulty in understanding that we are getting bibliographic citations, and that it is necessary to look at the source materials to see whether the question can be answered. Once they get past that point, the reaction of the clients is: Isn't this terrific – we have a much better grasp on whether or not our subject has been dealt with in the literature. They have also found the printout informative, sometimes eliminating the need to go to all the source documents.

– Vantine

We feel that it has really been a pleasure to have online search, and I think that we are riding the wave of the immediate future. There are several things that we feel are benefits, one of them being the improvement in community relations: we have a bigger audience than we had before and we are attracting different types of people.

As far as reference use is concerned, I think that we are finding that it is improving now that there are the added bases and we are using the service more. We are now able to answer requests for information that we could not have answered without online search.

Libraries are going to have to get into online search. The schools are producing machine-oriented individuals, and people are well aware of how one can get at information through the use of the computer. There are going to be more and more people in the public who are not academically or business connected who are after specialized information that they expect to get from libraries.

In summary, the online terminal was a much appreciated service. In the near future it will necessarily be more or less self-supporting; we hope that we can draw together some statistics that will help make this possible.

— Thomas

B.2 EFFECT OF ONLINE SEARCH ON ALLOCATION OF LIBRARY RESOURCES

Lessons learned: A library should ask several basic questions before adding online search service:

- Is there a real, not imagined, need for it? How does the service fit into the overall objectives of the library?
- Does the library have the necessary financial resources, time, personnel requirements to develop this service?
- Will this service produce better results than an alternative source (cost factors versus performance factors)?
- Will this service contribute substantially to meeting library objectives?

— Landtroop

The most important comment I would make to anyone contemplating the initiation of online search is that it does take a considerable amount of staff time. The time required for training, workshops, and searching has had a considerable impact on the entire staff.

This leads to the larger question of how online search fits into the overall goals of the library. As in many other projects, I didn't realize when we started out all that was involved, but as we continued, I began to see that there are questions that have to be answered. The more staff time we put into online search, the less time we have for other services. The question of which community to serve then arises: are we to serve a sophisticated, highly educated community, or are we to serve the community that has no interest in this specialized reference service, but has other interests and needs that we are unable to fulfill. We are going to have to come to grips with this problem. I believe we have to be flexible enough to include both; but, we may have to require the users of online search to pay for the full service, i.e., including terminal cost and staff time so that the service does not become a burden on the library system.

— Thompson

Overall, we are finding that online search requires a lot of effort -- publicity, training -- just to keep things going. It is not something that we can subscribe to and let sit around until we feel like using it -- like a new reference book. Each library (public and otherwise) will have to decide whether it is worth the effort.

-- DeWath

We have discussed in our library the possibility of eliminating some data bases in paper copy because they are online. However, I do not think that that is a good way to look at the problem, because if the online service is no longer available for one reason or another, then one has no backup in hard copy. Data base availability implies that we don't have to keep duplicate copies of materials, and that we can also go into microfiche to obtain an enormous saving in shelf space (we could save 200 to 300 linear feet of shelf space by doing this). We could also save the binding cost, particularly for references that are only checked occasionally with online search. We can have available data bases that we could not afford to buy in paper, and it broadens our entire scope of data retrieval.

-- Vantine

We have faced this resource question before. A lot of the paper sources that we subscribe to are very expensive, and at the present time we do provide very expensive business services for a limited audience. If you look at the people who are sitting at the business table, you will see the same persons being served over and over again.

-- Thomas

B.3 FEE AND FREE SERVICE

Our major hurdle was the decision to charge fees in a public library. It was decided that the library would absorb the staff time, connect time, and overhead; the terminal would be paid by N.S.F.; and the DIALOG cost would be paid by the patron. If we did not charge the patron the DIALOG cost, we would not be able to offer the service. We have had no requests for refunds or defaults by our DIALOG users.

– Sakai

The fee service has not presented as many problems as we had feared. If anyone objected to the public library selling a service, they didn't do so to our faces. We have had no problem that I know of with patrons failing to pay a balance due, bouncing checks, etc. We have a checks-only provision that works well for us. I'm sure that users would like it better if we accepted cash and credit cards, but no one has been terribly inconvenienced (although a couple of times staff members have written checks on their own accounts for people who showed up with cash only). We do feel the pressure of having to search economically when spending the patron's money; beginning searchers find that particularly discomforting. They have dealt with that by practicing a search on demo and then doing it "for real" as a standard search – a luxury that we may not be able to afford in the future. The standard search promises some relief in that situation. When we are more confident (with ourselves or the subject of the search), we prefer custom, so that we can get the benefit of our efficiency. The problem, I think, stems from the strangeness of having someone else, in essence, pay for our time. I have worked other places where our time was billed to clients (not libraries but consulting organizations). After a little initial discomfort, staff members learned to accept the idea that whatever time we spent was billable, that mistakes, false starts, and inefficiency were a part of any human activity.

If we did enough DIALOG searches, we would eventually realize that no search is flawless, and that the flailing around that we do sometimes is a legitimate part of the search.

– DeWath

We have had a number of people in library systems around the Twin Cities inquire as to nonfee use of the terminal. Up to the present, we have limited use to fee-paying INFORM clients. In 1977 a pilot study of free online searching for the general patron will be undertaken. The subject librarians will be responsible for determining whether a terminal search is the most cost-effective way of answering a question. We are finding that the average search cost runs $20 to $25 for a client, not including our INFORM librarian fee. (We have had searches ranging from $5 to several hundred dollars.). It is such a reasonable price that I feel that online searching is a tool that should be available in libraries everywhere.

– Vantine

With reference to our use of DIALOG to answer reference questions, I continually worried about the fairness of charging some patrons and not charging others. The criterion sometimes mentioned as the appropriate guide – use online search only "to save time" – is not workable in actual practice. I found myself looking at the patron's address to get an idea as to whether he or she could afford online search. This affected my decision as to whether a full online search was recommended or not.

– Thomas

We are concerned more than the public about charging a fee for searches. The public seems to be able to separate the online service from our free reference service. We are going to have to set up a fund, though, to handle the times when we use online search for our own reference questions and for bibliographic searches.

– Kristofferson

Houston Public Library has a long history of doing indepth reference work for our patrons – for free. This includes, of course, literature searching. If these manual searches are successful, then electronic searching is not necessary. This approach (doing manual searching first) certainly does affect the use of DIALOG.

I must strongly question Alice Ahlgren's choice of words (Vol. II, Evaluation Results, Appendix D) when she referred to the "attitude" of the HPL staff with regard to a fee-based service. Houston Public Library has no difficulty at all in charging for

patron use of online computer time. If a patron/client wants a literature search via computer, he will have to pay for it. A library does not have to have a "fee-based service" before they can have DIALOG, nor must they have DIALOG before they have a fee service.

– Landtroop

B.4 TRAINING AND ALLOCATION OF STAFF USING ONLINE SEARCH

B.4.1 Training Programs

I feel that the most beneficial training session would consist of two or three people at most with an experienced trainer some time after they have read the manuals. We are intelligent enough to absorb the basic idea of how the system works from the printed material; in the future it might be more valuable to read it first. At the training session one could discuss the finer points and have hands-on training.

There should be training beyond the initial one- or two-day session, preferably after the librarian has used the system for awhile. Advanced training should be offered on-location, since librarians find it hard to get away. It should occur once a year or maybe every six months. A minimum of three people should be trained to cover absence due to illness, job change, and differences in subject interest.

It was very difficult for us to become acquainted with the new data bases when we were not familiar with them in hard copy. For example, we were familiar with Foundation Center materials, so it was easy to use it in the online form. But when we dealt with Chemical Industry Notes or Oceanic Abstracts, which we weren't familiar with, we no longer were confident about what we were doing.

– Sakai

My training as a DIALOG operator began four months into the fee period. The initial training was done by an experienced operator who explained the key commands and gave a demonstration on the terminal to illustrate their use. Although encouraged to use demo time to practice with DIALOG, this brief introduction did not give me enough confidence to do more than one or two practice searches.

About three weeks after the in-house training session, a Lockheed-sponsored workshop for novice DIALOG operators was given in Palo Alto. This workshop was very helpful. It presented a comprehensive review of basic DIALOG search commands and techniques, thus summarizing bits and pieces of key information given me by

other operators or picked up on my own. In addition, there was a chance for hands-on practice with DIALOG terminals, which reinforced the information given earlier in the workshop. Although in-house training is useful, it is no substitute for a formalized practice session/workshop.

Shortly after attending this workshop, I began doing fee searches. I did very few demo searches for practice. In contrast to other operators who began doing fee searches after some months of practice during the nonfee period, I was doing fee searches with very little prior experience. As a result, my first fee searches were rather poor. Errors were made in typing, command syntax, and search logic. These searches took twice as long to do as comparable searches done by experienced operators. I had trouble keeping track of the commands given and sets manipulated earlier in the search, and often had to go back and retrace previous steps. The fact that my inexperience was costing the DIALOG patron money only served to increase my nervousness and unease during those first fee searches.

Nevertheless, I was learning. After a dozen fee searches, my search time dropped while my confidence and effectiveness rose. Soon, being a DIALOG operator became an enjoyable occupation, and has remained so every since.

Becoming a DIALOG operator in the middle of the fee period was not easy. Despite training sessions and demo time available for DIALOG practice, DIALOG proficiency can be gained only by doing patron-initiated searches. I just regret that those patrons for whom I did my first fee searches had to unknowingly subsidize my DIALOG education.

— Johnson

Since I knew nothing about computers or set theory, I didn't have the foggiest idea of what was going on initially. I felt that I didn't have enough time to train on the terminals. Another training session that came one month to six weeks later was of some value, but we should have had another followup a month after that. When we went to the workshop in May 1975, almost at the end of the free period, we learned about things that we had never heard about before (stacking, for example).

— Holtby

One of the major problems that I foresee for our continued use of online search is that of not having enough searches to keep our skills current. We have seen how rapidly we get rusty, and how difficult it is to pick up on new bases if we have no pressing need to use them. It is also likely that the money for training and for practicing online will be cut down or eliminated from the budget. But, they are essential in order to keep us even modestly competent, especially with new bases and search features being added all the time.

– DeWath

B.4.2 Staffing Arrangements

Staffing has been the biggest problem created by online search at San Jose. Since we did not add any extra staff for online search, we began to feel the strain as DIALOG requests increased from San Jose State University students. Fortunately, we had help from a SJSU library school student who received units for her work. Linda Erickson helped us through our busy free period.

During the period when fees were charged, the four operators were able to handle about fifty requests a month comfortably. Each of the operators specialized in a couple of data bases, assigned according to the operator's strengths. However, we conduct most of our searches in ERIC, a result of our high student usage.

I think it would be better to have a staff member assigned full time to do all the searches. That person would be able to study and receive advanced training in each data base and thereby do more skilled searching. Online search service takes time. For every minute online, an operator spends three minutes off-line. This time does not include the numerous inquiries we receive. Staffing is a serious consideration in deciding to offer online search.

– Sakai

We were never overwhelmed by the workload, but our staffing arrangements are more flexible than those of a library which must staff a reference desk. We did have some slight problems with distribution of requests among the staff. We leave requests in

an in-box until someone picks them up to work on them. Occasionally a request would get bypassed (especially a messy one), with everyone thinking that someone else would do it — but that is more a function of our way of distributing workload, than anything directly related to online search. We have talked about assigning requests, either in strict rotation or according to different subjects, but the staff was unanimous in its feeling that the current procedure was preferable, both in terms of distributing the workload fairly and getting the searches done with the least delay.

We have avoided assigning specific bases to individual searchers, because that would mean a heavy load for people doing the popular bases, and could mean that a request would need to be done in a hurry without the "appropriate" person being available to do it. However, that would make it easier to keep up-to-date on changes in the bases.

— DeWath

B.4.3 Number of Operators

From the user's point of view, I suggest that a single operator be utilized. A single operator can become a specialist; he gains more expertise by doing more searches. This system is preferable to spreading out the searches among many operators.

— McEwen

It is important that there not be too many operators because then you have a lot of people who have only a surface knowledge of how to perform searches. On the other hand, one operator does not work out well in a public library situation. It is difficult for one person to cover many subject areas, and from a staffing point of view, it doesn't work out well due to illness, vacation, etc.

— Kristofferson

B.4.4 Staff Attitude and Ability

The key to a successful online search operation is the staff. If the people who will be working with it are not enthusiastic, the use of online search service anywhere is almost guaranteed to fail. The patrons know of online search only through us, so

if we are skeptical or reluctant, or not interested in the patron's question, the patron will pick that up. If we aren't convinced of its value, we can't sell the patron on it; but, on the other hand, if we seem confident that we have gotten from DIALOG the best it can provide, however much or little, the patron is confident that the search has been as successful as possible.

– DeWath

The attitude of the staff and administration must be supportive when a library decides to offer online search. Many of our early problems intensified because of a poor attitude. As our attitudes changed, the problems with fees, workload, and terminal/computer became manageable. It's because of this positive, supportive attitude of the operators and of administration that DIALOG will continue for a third year at San Jose Public Library.

– Sakai

Fascinating tool – but you always wonder if you have all the material from that data base. If your search strategy had been different – would you have retrieved more or less – or even the same citations?

– McEwen

I question the validity of the time sheets where we recorded time spent in the interview and followup. I am quite sure that none of us put down the full time – we didn't want to think we spent this much time on this activity – or that it actually took that long to wrap up a search.

– McEwen

B.4.5 Interlibrary Cooperation

An alternative to the kind of arrangement that we have now is one in which one library acts as a central search facility for a large number of libraries, in a more formal arrangement than we now have in CIN. We have had so little participation from special libraries in CIN that I suspect that they never learned enough about DIALOG and/or the DIALIB project. Including a larger area, especially San Francisco,

would probably increase the use tremendously. The question would arise, how would the cost be shared, particularly the staff costs. In the East Bay, the public libraries are trying an arrangement whereby online search requests are sent to U.C.. It will be interesting to see how that works out, especially since the public librarians have been given no special training regarding the kinds of requests that are appropriate.

– DeWath

B.5 USE OF DIALOG FOR REFERENCE

B.5.1 Reference Use

Online searching opens up a new vista for the smaller library as well as the research library. It provides the small library with capabilities that they never had before and enables them to provide better service to the public. I would recommend online searching to any library that can afford it, no matter how small the library. I feel that it is a tool that can enhance their collection immeasurably.

Interlibrary loan and other networking situations make it possible for people to get copies of needed materials at little or no cost. This means that online bibliographic searching enables the person having access to a very small collection to find out what is available and begin to do a really decent literature search. It may take them a little longer to obtain source materials that aren't immediately available, but it is well worth it.

— Vantine

The ability to do full-text searching has made it relatively easy to verify a bibliographic citation when only limited information is supplied by the patron. The "hit" rate for such searches is high which means that a special collection like Municipal Reference has an additional tool in helping a sometimes demanding clientele.

— Luchessi

DIALOG was used for more than patron-initiated searches. We as librarians became interested in the possible uses of an information retrieval system in daily public library reference work, e.g., bibliographic verification and searching for a specific answer. More time is needed to determine whether a system such as DIALOG is a useful reference tool. It is unfortunate that there is no current study being conducted on this aspect.

We tried using DIALOG in our reference work. That is, we used it to find a specific answer to a subject query. It was used to save staff time in searching indices and/or

making available specialized indices. Our "hit" rate, unstatistically speaking was about 25 percent. It was hoped that the full-text capability of DIALOG would zero in on the specific topic. We need to do more reference searches on DIALOG before any decision can be made about its usefulness in public library reference.

– Sakai

Five of us received a one day DIALOG training session at the library in August. After the training session, we practiced diligently for a while and talked with our friends here in the Twin Cities who had the system, trying to find out how to best use the system.

Originally we limited online searches to those that we knew would be successful, i.e., those that we could plan a strategy for, and for which there was a data base we knew had the material. We did not do much in September and October because none of the INFORM questions seemed suitable for online search. However, our searches in November indicated that there was a great deal of information in the bases which could be retrieved once we became more base oriented.

Because of a newspaper article in September describing INFORM and our online search capabilities, the request for our service increased quite a bit. People were interested to see what the computer could do for them. As the number of searches on the system increased, our proficiency increased; we used the logic more effectively, truncated more efficiently, and began to understand the peculiarites of each data base better. Our searching results then began to show a noticeable improvement.

As DIALOG added new bases such as Science Citation Index and Dissertation Abstra we were able to do searches that we had not been able to do previously, and we developed additional skills for Chem Abstracts and for NTIS which have been most helpful.

We feel that DIALOG enhanced the service that we provide our paying clients many-fold. It has provided an efficient, interesting, and informative backup service to

the kinds of research that we already do. It has also enabled us to handle questions that formerly we would have had to subcontract because of a lack of sufficient resources.

– Vantine

B.5.2 Data Bases

We find NTIS most valuable – it provides us with information that gives us good leads to other sources. We have found it a fast, efficient base to search, and we've had excellent results. We're gaining more experience in CAIN and like that base very much also.

Psych Abstracts has also been invaluable. It is a difficult base to search manually and we can find a great deal of material online that would not be cost effective to obtain by manual search. We had never realized the wealth of material in Psych Abstracts until we used it in the line form. The Foundations data bases have been of great use to our Sociology Department which is a regional repository for these materials as well as to INFORM.

The one frustration we have had in using the system is that Food Technology Abstracts is not online in DIALOG. It is something we use constantly and it is very cumbersome to use manually. There are so many cross checks that have to be done that we would really appreciate having online access. If Food Technology Abstracts had been online we would have easily doubled the number of searches during the trial period.

– Vantine

DIALOG provides several files which are useful for urban research. The most pertinent is probably NTIS which, with its strong base of government-sponsored research, covers many areas of interest to municipal managers. In recent months, for example, San Jose Municipal Reference Library has conducted searches in NTIS for city staff on such subjects as computer design of sewer systems, pedestrian safety, urban goods transportation, bus transportation, energy conservation in buildings, and health needs assessment. The results of our searches in NTIS have generally been very good, and the flexibility of search techniques has greatly simplified access to that body of report

literature. Other files, such as Compendex or ABI, which focus on certain aspects of public works, personnel management, administration, finance, and the like, are also valuable in supporting an urban affairs reference service.

– Luchessi

Our biggest problem is not having information about the data bases. Data bases have been added and we have not received instructional material until several months afterward. We have not had specific training in the use of most data bases. Predicasts was on for a year before we learned how to operate it. There are some new bases online for which we may be using the wrong techniques because we are basing our approach on the brief blurb that was in the Chronolog.

– Doudell

Individual thesauri for each data base would be a big help.

– McEwen

Having Lockheed staff as close as a local phone call has been helpful. Upon occasion we have asked for help in more technical data bases.

– McEwen

B.5.3 Presence of Patrons During Search

One point that should be emphasized is the importance of performing searches with the patron in attendance. From our experience it works much better; one knows exactly what the patron wants.

– Kristofferson

B.5.4 Location of Terminal as Factor in Use

We are one library in a group of 13 county libraries. Although we have sent these libraries promotional material, we have not been receiving many questions from them. Most people who have come in for searches either have contacted us directly or are

people who regularly use our library. The fact that the computer terminal is not physically present at these other libraries seems to make a difference.

— Doudell

I believe that the patron is more attracted to online search if the terminal is located in his local branch. We were surprised that when we mentioned the possibility of using the more expensive TWX for the third year, we had some patrons who immediately volunteered that they were willing to pay the extra cost rather than go to a more distant library.

— Thomas

B.5.5 Use of Offline Printing

We rarely use offline printing. We feel that the three or four days of waiting for a printout is a detriment for most of our questions. We use offline printing only when we have long-term projects or when the person indicates they really do not have immediate deadlines. Three or four days is too long if you are interested in a business question. The businessman generally waits too long to ask the question, and he must have his answers as rapidly as possible.

— Vantine

B.5.6 Record Keeping

Our major problem has been reconciling our Lockheed/DIALOG invoice against the amount we collected from the patron. A usage log containing date, data base, time, search number, and cost was a necessary record for verifying the DIALOG invoice. It would be better if the cost could be provided by DIALOG along with the online time at the completion of each search.*

— Sakai

One of the difficulties we experienced was the record keeping. We have had the logs to keep and the monthly reports to prepare. Also, one of the biggest pains is

*DIALOG now provides the cost information online after each search.

computing the cost of each search for each data base. We recommend that an online search service should indicate the cost for each search. The different costs for each data base leads to time-consuming computation, and also leads to errors. We seem to spend as much time computing the cost of a search as doing the actual search online.

– Holtby

B.5.7 Reliability of Service

Tymshare and Telenet give us more reliability problems than DIALOG does. We have only been inconvenienced once by a DIALOG crash; the other times we have had a connection problem. In general, we have had very good service indeed.

– Vantine

B.6 NEED FOR PUBLICITY TO PROMOTE USE OF DIALOG

B.6.1 Publicity to Library Staff

It is important to establish a base of support within the library by running training sessions for librarians who might forward questions to the search center. It is important that staff members not feel left out. They should not regard the online search system as a special tool closed to them, but as something that has practical application for every reference librarian.

We had ten or twelve introductory sessions for staff members of any level who were interested, from the janitors right up to the director. We had a total of sixty or seventy people who attended, out of a staff of 220. I explained the online system to them and how it is used, and we ran demonstration searches. Each department was asked if there was a professional staff member who was interested in online searching. About twelve librarians were then trained more intensively on how one sets up a search strategy and were given time to practice on the terminal. Some of these persons have practiced and some have not.

– Vantine

Regarding guidelines for public libraries considering online service, I would emphasize making librarians familiar and comfortable with the service through demonstrations in small groups and in familiar subject areas. Once the librarians are enthusiastic (as most of them are after having seen successful demonstrations), likely search topics seem to flow in.

– Neufeld

It should be pointed out that all of the staff members here have enough knowledge of online search to be able to answer patron questions about the system when the search staff is not available.

– Kristofferson

B.6.2 Publicity to Other Libraries

Branch librarians will also remain a problem forever more. They don't care enough to spend the time to learn enough to take the initiative in generating online search requests and will have to be relied on merely as a pipeline for users who have already decided that they want DIALOG searches. They simply have too many other things to worry about; DIALOG is too low a priority. Most, however, are willing to relay a request, now that they have tried it a few times and no one has bitten them.

– DeWath

It may be that we should provide more information to the librarians in these other libraries so that they will have a better idea of what online search is, and what it can supply. Although I don't operate the terminal, the little knowledge that I have is important in that it helps me answer questions about online search when I am at the reference desk. Those who are not familiar with online search can have an erroneous idea of what the true capabilities of the system are with respect to a given question.

– Thompson

We feel that the time was not sufficient to make all librarians aware of the ways in which the program could be of service to them and to their users. We have not yet succeeded in reaching the entire potential clientele but think we will in time. I

think the committee and the board are convinced the service is worthwile. More spadework has to be done to remove objections of librarians to charging for services, and hesitation to suggest methods with which they are not familiar, but this too is easing with time.

– Neufeld

Beside the newspaper article, we have done no outside publicizing of the online service other than at meetings such as the local SLA chapter, the American Law Librarians Association, and an American Marketing Association seminar on information retrieval. We have also discussed the service with librarians throughout this region. We try to make users aware that online service is necessary if you are really going to do a good job for most business and technical questions.

– Vantine

B.6.3 Publicity to Patrons and the Community

We have not used handouts or other printed material for the public. However, we have taken the opportunity, whenever possible, of performing demonstrations for business people. When we receive an inquiry from corporations concerning the system, we try to arrange for a demonstration. There has been an increasing and continuing interest in what is available online. If we feel that an online search is relevant to a question, then we mention this to the client indicating the possible results of the search and the possible cost. In nine times out of ten, the client is interested in the computer search.

– Vantine

We had discouraged publicity because we didn't have the staff to handle more questions, but publicity is a chicken-and-egg situation: if you don't have the support for the staff, you can't publicize the service; but if you don't publicize the service, you don't get the demand and you can't get support for the staff. We may have to go through a bad period of pushing the service, contacting business, technical, and professional groups in order to build usage. Then, we can attempt to charge a fee to cover staff time. We have not publicized the way Redwood City has, and still the word has

spread. About 50 percent of our searches are for business clientele, but there is going to have to be a lot more publicity if we want to promote DIALOG to reach all potential users.

– Thomas

Publicity will remain a problem forever more. Most people don't need online searches frequently enough to qualify as repeat users. We'll always be trying to find and sell new users. Fewer users (fewer than during the free period) mean less word-of-mouth publicity, which still accounts for most of our business.

– DeWath

We have some patrons who are computer experts who know exactly how the system will work and what they want when they come in. We have the opposite extreme of people who know nothing about computers and who are unsure as to how to express their requirements. We therefore spend a lot of time explaining how online search works and what is required, and we make this explanation over and over again. The examples in our handouts have not been thorough enough to give patrons an idea of what the steps are in formulating a search strategy. It would be nice if they could look at something before they come in. Usually we must pull out a search that we have already done to show them how the system works. Many times they still don't understand, making it difficult to produce a satisfactory search.

– Doudoll

B.7 WHO ARE THE USERS (AND NONUSERS)?

Our experience was shaped so much by the user – college students doing term papers or theses – where they just wanted a bibliography to include. I had a feeling that most of them would never look up the actual article or document, but would just add the full list as their bibliography. Although this was not true of all cases, the majority gave me this feeling.

– McEwen

The response from users has been favorable, that is, from those who have actually used it, but the majority of our users aren't interested. By favorable, however, I mean less than overwhelming – the world is not beating a path to our door. No doubt as more data bases are added DIALOG will appeal to more people, but it will still appeal mainly to scholars and researchers, and to people whose businesses are directly related to subjects covered by DIALOG. These are not the people who form the backbone of the public library, much as we like to believe that they are – few scholars and researchers think of the public library as a resource. We would like to change that, and DIALOG can help us to change that, but it is a long, slow change.

– DeWath

We have worked with the Municipal Information Library to answer questions posed by the mayor and other city officials. There is active support from our city officials. They are aware that a tool is available to locate important information for their needs in a short time.

– Vantine

There may be more referral from branches than we realize, since some of the patrons who call us directly may have been directed to us by their branch libraries.

– Thomas

Our county librarian, Barbara Campbell, felt that it was important to provide free search for the county departments since they provide certain services to us. We were disappointed in the degree of county interest. Only the Planning and Public Works Departments came to our demonstrations; there are still many departments that apparently have not discovered what we can provide through online search. Nevertheless, we have done a fair number of searches for Planning and Public Works and also for the Health Department.

– Thomas

We went to the county offices and gave a number of demonstrations. We haven't charged the county departments for any of the searches that we have run. However, we have not received the response that we though we would have. We had looked

to the county as one outside source of demand in the future, and we had thought that a demand would develop and that they might help with some funding in the future. This was a big disappointment to us.

— Holtby

B.8 ADDITIONAL COMMENTS

This section presents additional comments that arrived too late to be incorporated into the previous topic format.

- Lisa H. Naef, Head, Adult Reference and Reader's Advisory Services, Redwood City Public Library

Serving a population of approximately 55,000, Redwood City Public Library has a main library situated downtown, a branch in a residential area, and supports a small library in a community center.

Our computer terminal was allocated to the Redwood City Public Library (hence after referred to as RCPL) which was placed in the main library reference/reading room. The terminal is Western Union Data Services 300 Impact Printer at 30 characters per second and is not portable. Although we do not enforce a silence code, we received so many complaints about the noise the terminal generates while in service, NSF agreed to provide an acoustical cover for the machine. Since the cover was installed, we have had no complaints about the noise.

The RCPL reference staff is five librarians (including the unit supervisor). All five librarians are searchers on the DIALOG system. Each librarian attended one all-day introductory workshop on computer search techniques. Any additional skills have been acquired by experience and the use of manuals provided by Lockheed Information Systems.

The five librarians are generalists, although one staff member, Mr. Thomas Kam, has a more specialized knowledge of business, science, and technology than the others.

Until February, 1976, RCPL ran the computerized information retrieval system on a drop-in basis. But the planning of a search strategy and the explanations to the patron took up so much time, we began to require that appointments be made. The computer is online only until 5:00 p.m. Monday through Friday Pacific Standard Time, and noon on Saturdays. Fridays and Saturdays were not good days to run DIALOG searches as RCPL is short-staffed on those two days each week, due to rotating weekend schedules.

Since June, 1975, we found that most DIALOG system users were graduate students doing research papers or dissertations. Few users were repeaters. Some business firms, primarily engineering firms, used the DIALOG system at RCPL. Most users of our DIALOG services were not Redwood City residents, nor were they employed in Redwood City. In fact, 50% of the users did not reside or work in our county. The maximum number of searches we ran any one month was 39; the minimum was 7. We found that the staff spent anywhere from 30 minutes to one-and-one-half hours in explaining the DIALOG system and planning a search with a patron. We tried to encourage patrons to be with the searcher when we ran their searches.

Not being used to charging for our services made us perhaps too aware of the cost factors of the searching. We thus spent a great deal of time preplanning our searches and then running a very tight, preplanned strategy on the computer. Many patrons stated that they came to RCPL for DIALOG services because it cost less than going elsewhere. Frequently patrons asked us to limit the cost of their search to under $15.00. This request increased the anxiety of the librarian who often felt her understanding of the data bases left much to desire and the patron would not get what he was paying for.

To ease this anxiety and to be fair to the patron, I would recommend that money be allocated in budgets to absorb the cost of errors made by searchers (such as running the search in the wrong base).

DIALOG has expanded from 20 bases to over 30 in less than 6 months. As more data bases were loaded onto the system, we at RCPL became less sure of our abilities to meet patron requests. Some of the files were problems because none of

us have either the subject knowledge to understand the search request or an understanding of the standards and procedures used in compiling the index or abstract services being tapped. In bases like BIOSIS, we had problems comprehending the different codes and deciding how to combine them to "hit" what our patron was seeking. In my opinion, libraries who offer this type of service will have to send their searchers to indepth training sessions on the structure of the data files and to more advanced workshops on computer manipulation. Libraries will have to budget time and money to send their searchers to the various seminars offered by the "publishers" of the different data bases. Costs range from no charge to $150 or more per person per session.

The five librarians who provided DIALOG services at the Redwood City Public Library have come to some conclusions about the services. While the idea of computerized information retrieval is very exciting, the DIALOG bases are too specialized bibliographic tools, and too costly to be used by the general public. We believe these data bases probably are put to better, more frequent use in a larger library. Our medium-size library does not have the periodical and document collections to provide the materials cited in the bibliographies obtained through the computer. This lack means that our patrons either have to wait for us to obtain the desired material by interlibrary loan or they go to another source. If the Reader's Guide to Periodical Literature were computerized or local statistics such as the crime rates in town, I think information retrieval services would be used by Redwood City residents. The DIALOG data system is not the ideal one we should be offering. Although we started this project with great enthusiasm, we find that we do not have enough staff to offer as good a computerized information retrieval service as should be possible with DIALOG. We do not have the time to take several hours each week to study the manuals and to practice on the equipment.

DIALOG did not lead to an increased use of our library as a unit by community residents formerly not library users. Most DIALOG users came to our library for that purpose only: to get a search done.

At the end of the NSF grant period, DIALOG services were discontinued at the Redwood City Public Library for the reasons I've described. However, we did gain an invaluable experience in the use of computers in the library. Additionally, we reinforced and improved our reference interview techniques in working out search requests with DIALOG users. We hope that when data bases that we feel can be more appropriately used in a small library are computerized that we will be able to offer such services again. Mr. Oscar Firschein was most helpful to us throughout the NSF project as were his colleagues in Lockheed Customer Services.

- Barbara J. Campbell, County Librarian, County of Santa Clara

The Santa Clara County Library through our membership in the Cooperative Information Network (CIN) was invited to participate in the experiment to show the value of the DIALOG service in a public library setting.

Several very positive results can be identified. First, in my mind, is an expansion in visibility to different segments of our communities. It seems increasingly apparent to me that if libraries are going to "make it" during the next decade in the scramble for the limited available funds, the library program must be made more vital and important to the community and particularly to the community leaders – those controlling the funds. DIALOG helps dramatically in this area. A segment of our public discovered that the modern public library has a sophistication beyond what they had imagined. Equally important in our case, major segments of County government were made aware of DIALOG's value, and I expect this to have very favorable long-range impact. This happens to be a current "soap-box" of mine – that libraries must use every conceivable way to become important to their communities. DIALOG helps.

Second are the benefits to the staff. Our staff, while feeling pushed and pulled, enjoyed the experience – the challenge, the opportunity for professional growth, and the pride in offering a new depth of service.

Now to explain why we dropped the program this year. In our area, as in most places, we are involved in cooperative efforts, and we are active in our South Bay Cooperative Library System. The Santa Clara County Library is a group of community libraries. My hope is that we will offer the best in direct community library service, given limited funds. This year we have had to face program cuts to balance to available funds. In the DIALOG experiment our County has had two terminals, at our Cupertino Library and at the San Jose Public Library. Usage currently supports one terminal for our region, and I feel we should follow the structure of our cooperative system. Therefore, the one terminal should be located at the San Jose Public Library.

As far as administering the program, any pressure was not on administration, but on staff. Our Department of Finance has always taken a most helpful attitude in working out new programs in the most direct and uncomplicated way, so we had no problems in setting up the program.

Because the staff wanted to give the service, they minimized the problems, and they worked out solutions.

© Homer L. Fletcher, City Librarian, City of San Jose, California

I have been most pleased with the success of the DIALOG project. As our first experiment with on-line information retrieval, the project has been a valuable learning experience for administrators and reference staff, as well as the general public. We have been given the opportunity to observe, first hand, the benefits of this highly sophisticated service, and feel that a new dimension in library service has become available to us and to our patrons.

At the outset, two concerns surfaced from our point of view. First, the Cooperative Information Network Board of Directors took on the project without getting input to any extent from the public libraries who would have to do the work. Second, Lockheed was hesitant about releasing budgetary information about the project even though it was supported by public funds.

During the free period, the primary problem faced was that of inadequate staffing. The San Jose Library had lost thirteen positions in 1974–75; all from the Main Library. Because of the fact that no staffing had been furnished through the NSF DIALOG grant, our already depleted staff resources were further strained as DIALOG became a high-demand service. A staff recommendation to terminate the experiment was carried to the City Council. Council chose to continue the project. Following this action, it became necessary to adjust and reschedule DIALOG service hours. It is clear that staffing is a significant factor in the success of DIALOG service. We would urge any potential DIALOG user to appropriate adequate additional funds for personnel prior to installing the service. We do not feed that library patrons can benefit from the service to the fullest extent if overall staffing resources are strained. It follows, too, that staff enthusiasm for DIALOG may wane under adverse staffing conditions.

The fee/nonfee issue in public libraries is a philosophical question that was discussed thoroughly by San Jose Library administrators. The decision to charge fees was made by the City Librarian following this discussion. This was clear choice in view of the fact that, since no funds could be budgeted, a nonfee decision would mean removal of the service; a service which had proven itself valuable to our patrons.

We have been so favorably impressed with the service and information available through DIALOG that we are considering the possibility of an additional terminal for our Municipal Reference Library which has just been moved to City Hall from the Main Library.

Appendix C

LIBRARY PARTICIPANTS IN THE STUDY

LOCKHEED PALO ALTO RESEARCH LABORATORY
LOCKHEED MISSILES & SPACE COMPANY, INC.
A SUBSIDIARY OF LOCKHEED AIRCRAFT CORPORATION

C.1 SAN MATEO COUNTY LIBRARY

- James W. Buckley, County Librarian
- Anna M. Scott, Reference Coordinator
- Nancy Lewis, Reference/Documents Librarian (transferred to another Division 5/75)
- Beth McNabb, Reference Librarian
- Joan P. Tobias, Reference/Documents Librarian (from 9/75 to date)
- Nancy DeWath, Reference Librarian (left project 5/76)
- Wayne Smith, Reference Librarian
- Nancy Crabbe, San Mateo County Dept of Public Health & Welfare Librarian
- Evelyn Helmer, Public Information Coordinator
- Dennis Nolan, Staff Artist

Mr. Buckley gave his approval for our participation and encouraged usage and demonstrations for County Branch Libraries, Peninsula Library System Libraries, and for County Government departments.

Ann Scott, Nancy Lewis, Nancy DeWath, and Beth McNabb were the first trained operators. Nancy DeWath did most of the work in developing forms, logs, and initial training of staff. All these reference librarians participated in demonstrations in libraries, at organizational meetings, and in County departments. Wayne Smith was the last librarian to receive training in the group of librarians on the staff at the beginning of the project.

Joan Tobias received the training after she reported to the Reference Division and has been a Dialog researcher ever since; she completed the Predicast special training course in December 1975.

Nancy Crabbe, librarian for a departmental library, was trained in DIALOG because she was a heavy user and this reduced the workload on the County Library Reference Staff.

Evelyn Helmer is the San Mateo County Library Public Information Coordinator and kept up a flow of publicity for San Mateo County Library. Dennis Nolan, staff artist, contributed ideas for local displays and publicity brochures which serve to attract attention.

All the people listed contributed time and effort in support of the project as well as the remainder of the Reference Division staff who had to cover while the Reference Librarians were at training sessions and demonstrations.

Anna M. Scott,
Reference Coordinator

C.2 REDWOOD CITY PUBLIC LIBRARY

First Year:
Sally Drew, Librarian III
Thomas Kam, Librarian II
Dolores King, Librarian I
Alice Tabari, Librarian I
Lucile Benedetti, Librarian I

Second Year:
Lisa H. Naef, Librarian III
Thomas Kam, Librarian II
Lucile Benedetti, Librarian II
Susan Kaplan, Librarian I
Linda Lindeen, Librarian I

Each of these persons acted as interviewer, search operator, and did the followup work with Dialog users.
In addition the Librarians III coordinated assignments, kept the account books, and made reports.

Lisa H. Naef
Head, Adult Reference and Readers' Advisory Services

C.3 SAN JOSE PUBLIC LIBRARY

- Beverly Chance, Office Supervisor, handled DIALOG invoice/billing
- Rose Crimi, Administrative Services Officer, established administrative procedure involving DIALOG
- Homer Fletcher, City Librarian, approved and supported DIALOG
- Bob Johnson, Reference Librarian, DIALOG operator
- Charleen Kurotsuchi, Reference Librarian, DIALOG operator and DIALIB liaison
- Rob Luchessi, Reference Librarian, DIALOG operator
- Scotty McEwen, Reference Librarian, DIALOG operator
- Richard Rendler, Chief, Public Service, administrative liaison
- Charlotte Sakai, Reference Librarian, DIALOG operator and DIALIB liaison
- Katherine Devonshire, Typist Clerk, handled DIALOG printouts and statistics
- Dorotha Edwards, Typist Clerk, handled DIALOG printouts and statistics

Charlotte Sakai
DIALIB Liaison

C.4 SANTA CLARA COUNTY LIBRARY (CUPERTINO)

Credits are due to:

Barbara Campbell, Santa Clara County Librarian, for her agreement to allow participation in the NSF Study, providing space and allowing staff time as needed for planning, meetings, reports, workshops, and DIALOG demonstrations and searches as required throughout the project, and for her enthusiastic support of the investigation of a new dimension in library service.

Phyllis Levine, Supervisor of Adult Services, Santa Clara County Library, for her participation in the organizing and planning of the project as it operated in the Cupertino Library and elsewhere.

Lois Thomas, Reference Librarian, Santa Clara County Library, who, as head of the Research Center, managed the DIALOG program at Cupertino Library.

Allison Holtby, who has been Chief Reporter for the Cupertino operation as well as a DIALOG demonstrator and searcher, and whose ideas as well as time and effort contributed much to the program.

Charlotte Doudell, whose skill and previous knowledge of machine searching added a great plus to the project at Cupertino.

Eric Kristofferson, whose scientific background coupled with knowledge of automated retrieval systems promoted a high degree of expertise in the Cupertino program.

Dale Thompson, who, as Regional Librarian in charge of Cupertino Library, has constantly coped with adjusting schedules and workloads to permit DIALOG to operate smoothly for the benefit of patrons and the project.

Cheryl Mouton, now with Richmond Public Library, who enthusiastically participated in the early stages of the program at Cupertino, giving demonstrations and conducting searches.

Mary Ferber, now Order Librarian for Santa Clara County, who devoted time and energy to the Cupertino program in the first months of the project, giving demonstrations and conducting searches.

Lois Thomas
Head, Research Center

C.5 MINNEAPOLIS PUBLIC LIBRARY (INFORM)

- Joseph Kimbrough, Director
- Carol L. Vantine-INFORM Librarian
- Carol H. Jurusik-INFORM Librarian
- Amy E. Raedeke-INFORM Librarian

C.6 CLEVELAND PUBLIC LIBRARY (FACTS FOR A FEE)

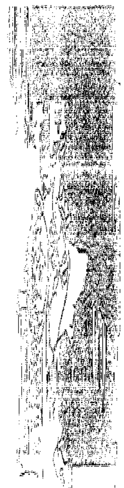
- Ervin J. Gaines, Director
- Ethel L. Robinson, Head of Main Library
- Jean Davenport, Facts for a Fee Consultant

C.7 HOUSTON PUBLIC LIBRARY

- David M. Henington, Director
- Ann Landtroop, Head, Business, Science and Technology

C.8 LONG ISLAND LIBRARY RESOURCES COUNCIL

- David Wilder, Director
- Judith B. Neufeld, Assistant to the Director



Appendix F

MECHANICS OF FEE COLLECTION

This appendix presents the San Jose Public Library procedures for fee collection. The procedures are typical of the accounting chores required of the librarian.

CITY OF SAN JOSE, LIBRARY DEPARTMENT PROCEDURE FOR ACCEPTING MONEY FOR DIALOG SEARCH

- DIALOG Operator
  1. Explains the two types of DIALOG searches available, and determines the type of search the patron wants.
  2. Records information requested in DIALOG Search Log except for the time and amount.
  3. Fills in type of search, dates, amount, search number and signature, on two-part DIALOG Search Agreement, Form 530-546.
  4. Has patron sign agreement and take duplicate copy to the cash register at the Return Desk.
- Return Desk Staff
  1. Rings up $5.00 for Standard Search or $5.00 for a Custom Search using "N" key on cash register to record fee (Revenue #001-03231-04)
     a. Returns Search Agreement to the patron along with the cash receipt.
     b. Instructs patron to return the copy of the agreement with the cash register to the DIALOG Operator.
- DIALOG Operator
  1. Records receipt number on original and duplicate copy of Search Agreement.
  2. Proceeds with search.
  3. Standard Search Only. Give search information to patron.
  4. Files original search agreement in file to be sent to the Business Office at the end of each month.
- DIALOG Operator
  1. Custom Search Only. Subtracts $5.00 deposit from amount of search and fills in balance due on original and customer copies of the search agreement.

2. Asks patron to take search agreement to the cash register at the Return Desk, pay balance due, and return it with the cash register receipt to receive search information.

- Return Desk Staff

1. Rings in balance due and returns search agreement with the cash register receipt to the patron.

- DIALOG Operator

1. Records receipt number on original and duplicate copy of Search Agreement.
2. Gives search information to patron.
3. Files original search agreement in file to be sent to the Business Office at the end of each month.

SEARCH FOR ANOTHER CITY DEPARTMENT

- DIALOG Operator

1. Asks employee requesting the search what account code the search should be charged against.
2. (Verify Department approval by phone).
3. Fills out DIALOG Search Agreement and adds account code on form for charge back.
4. Has employee sign.
5. Proceeds with search.
6. Adds balance due if a custom search is requested.
7. Gives employee duplicate copy of agreement and search information.
8. Files original search agreement in file to be sent to the Business Office at the end of each month.

MAXIMUM MONTHLY USAGE

- DIALOG Operator

1. Keeps a running account of hours and cuts off searches when up to 25 hours for the month.

REFUNDS

- DIALOG Operator
  1. Fills out refund slip provided by Lockheed.
  2. Brings refund slips to the Business Office the following day for preparation of SPD.
- Business Office Staff
  1. Makes Xerox copy of refund slip.
  2. Sends refund slip to Lockheed for credit.
  3. Marks copy of refund slip "Original," stamps "payment approved," signs, and attaches to SPD.

PAYING INVOICES FROM LOCKHEED

- DIALOG Operator
  1. Routes by the second working day of the month the DIALOG Search Agreement and copy of search log to the Business Office for previous month's transactions.
     a. Notifies Business Office of pending refunds.
- Business Office Staff
  1. Compares search agreement with invoice from Lockheed to determine correct charges.
  2. Stamps invoice approval and signs.
  3. Makes Xerox copy of invoice.
  4. Prepares partial payment voucher for amount of invoice using Charge #001-07235-52.
     a. Refers to SPD and date for any refunds for which we are receiving credit.
  5. Attaches original copy of invoice to partial payment voucher.
  6. Files Xerox copy of invoice with copies of logs.

Appendix G

MEETINGS AND PAPERS

This appendix pre[illegible]s a list of the meetings held and indicates the kind of coordination required in a project such as this. A list of papers presented indicates the dissemination of knowledge concerning the project.

G.1 COORDINATION MEETINGS

May 17, 1974. Description of study to CIN meeting, Palo Alto, Cal.

June 17, 1974. Discussion of agreements with participating library heads. These agreements were to be signed by the respective cities and counties, and Lockheed.

July 11, 1974. Applied Communication Research made a presentation concerning the data gathering plan at a training session for the librarians.

July 30, 1974. General meeting of participating libraries to discuss initial experiences with the system.

August 2, 1974. Arrangements for opening ceremonies, San Jose.

August 6, 1974. Publicit[illegible] Committee meeting at which a recommendation was made to employ a publicity coordinator.

August 15, 1974. General meeting of participating libraries to discuss experience to date and review r[illegible]vised evaluation plan.

August 22, 1974. Opening Ceremonies at San Jose Public Library attended by city dignitaries, City and County librarians, and NSF and Lockheed representatives.

August 25, 1974. Oversight Committee meeting to review progress to date.

September 13, 1974. The heads of the participating libraries met at the San Mateo Educational Research Center (SMERC) Redwood City to discuss policy matters including possible limitations in the use of the system and the problem of fee for service. A Pricing Policy Working Group was established by the libraries to deal with the latter question.

October 10, 1974. Reference librarians from the participating libraries met at the Redwood City library to discuss publicity, the evaluation questionnaire, and to share their experiences with the system.

October 24, 1974. Ferguson, Helmer, and Firschein met at Stanford to discuss the marketing effort status and strategy. In-library publicity was to be stressed until after January 1, a saturation campaign was planned for one community in January - February, and some in-library media presentations were considered.

October 25, 1974. C. Mick and A. Ahlgren (ACR) met with R. K. Summit and O. Firschein to discuss the user questionnaire and the evaluation plan.

October 27, 1974. Frances Grant conducted an additional training period for reference librarians of the participating libraries to bring them up to date on some of the new data bases and to show some advanced search techniques.

November 21, 1974. CIN Presentation, Skilling Auditorium, Stanford University R. K. Summit, O. Firschein, F. Grant, Lockheed; N. DeWath, San Mateo County Library).

January 16, 1975. Meeting of the librarians at Redwood City. The Cooper/DeWath time study was discussed and Alice Ahlgren of ACR discussed the mechanics of questionnaires.

February 3, 1975. Meeting of Oversight Committee Review of ACR evaluation material and the fee-for-service policies to be used by the libraries.

March 19, 1975. Meeting at San Jose Public Library to review the Cooper/DeWath study.

March 1975. Heads of libraries met and requested a subsidy because of unexpected personnel costs.

April 7, 1975. Meeting with heads of libraries, CIN, and Lockheed in which a $10 per terminal hour subsidy was proposed for submission to NSF.

June 1975. Meeting of librarians to discuss pay period operation.

November 24, 1975. Oversight Committee meeting concerning the need for planning for the third year of operation at full fee, the need for follow-on studies of nonusers, and the continued collection of time and cost data.

February 1976. Site visit by ACR to out-of-state libraries participating in study.

June 3, 1976. Oversight Committee meeting to review first draft of final report.

C. 2 PRESENTATIONS AND PAPERS

"Computerized Retrieval Comes to the Public Library," Oscar Firschein, Lockheed Information Systems; Evelyn Helmer, Publicity Consultant; Sally Drew, Redwood City reference librarian; and Nancy DeWath, San Mateo County reference librarian. Bay Area Chapter of the American Society for Information Science, 12 Dec 1974

"Computerized Retrieval in a Public Library Setting," O. Firschein and R. K. Summit, COMCON '75, IEEE Computer Society, San Francisco, California, Feb 1975

"Factors Affecting the Adoption of an Online Service by the Public Library," Alice E. Ahlgren, ASIS Midyear Conference, Portland, Oregon, Jun 1975

"Providing and Pricing Computerized Search in the Public Library," Oscar Firschein and Roger Summit, NSF colloquium, "Strategies for Improving Special Library Effectiveness," Northwestern University, Jun 1975

"Online Retrieval in a Public Library Setting," Roger Summit and Oscar Firschein, Special Libraries Association meeting, Chicago, Jun 1975

"The DIALIB Project," O. Firschein, Institute on Library Service to the Business Community, State University of New York, Albany, N. Y., Jun 1975

"Online Search Services in the Public Library: Project DIALIB," Alice E. Ahlgren, American Library Association Annual Conference, San Francisco, California, 3 Jul 1975

"Providing the Public with Online Access to Large Bibliographic Data Bases," Oscar Firschein and Roger Summit, 2nd USA-Japan Computer Conference, Tokyo, Japan, Aug 1975

"The DIALIB Study," Roger Summit, 1975 Engineering Foundation Conference, Henniker, New Hampshire, 11 Aug 1975

"The Cost of On-Line Bibliographic Searching," M. D. Cooper, N. A. DeWath, ACR-003-75-01, Applied Communication Research, December 1975 (to be published) in a revised form in Journal of Library Automation, Sep 1976)

"On-Line Reference Retrieval in a Public Library," R. K. Summit and O. Firschein, Special Libraries, Feb 1976, pp. 91 – 96

"Effects of Fee for Online Reference Retrieval in a Public Library Setting," O. Firschein, and R. K. Summit, 67th Annual Special Libraries Association meeting, June 1976, Denver, Colorado.

"Providing Fee for Service Online Searches Through the Public Library," A. Ahlgren, 67th Annual Special Libraries Association Meeting, Jun 1976, Denver, Colorado.

"An Investigation of the Public Library System as a Linking Agent to Major Scientific, Educational, Social, and Environmental Data Bases," R. K. Summit and O. Firschein, National Science Foundation, Division of Science Information Seminar, "Alternatives to Traditional Information Transfer Mechanisms," Washington, D.C., Sep 28-29, 1976

"Online Reference Retrieval in the Public Library: Lessons Learned," O. Firschein and R. K. Summit, American Society for Information Science Annual Conference, San Francisco, California, Oct 4-9, 1976

"Online Use of ERIC in a Public Library Setting," R. Johnson (San Jose Public Library) and O. Firschein, ERIC Users Conference, San Francisco, California, Oct 6, 1976