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ABSTRACT

This report covers the background, scope, and findings of a multifaceted research project which focused on data collection and analysis related to online public access systems (OPAC's); the ultimate goal of this project is to improve information access through OPAC design and enhancement. To assist library decision-makers when planning for the initial installation of OPAC's or the enhancement of existing systems, this volume evaluates and integrates the findings detailed in the first two. Because the system/patron interaction is central to the study, a conceptual model for online catalog research which illustrates the user interface for an interactive system is presented. A project overview discusses objectives, methodologies, data collection and analysis. Summaries are provided of findings obtained through self-administered questionnaires for OPAC users and non-users, as well as through focus group interviews and transaction log analysis. Findings are discussed both generally and then specifically in a question-answer format, and areas for additional research are suggested. Six references are listed. Four appendices include pretest and final user and nonuser questionnaires. (Author/LMM)

Report Number: OCLC/OPR/RR-83/4
1983 March 31

Final Report to the Council on Library Resources

VOLUME III

of Three Volumes

A COMPREHENSIVE STUDY OF ONLINE PUBLIC ACCESS CATALOGS: AN OVERVIEW AND APPLICATION OF FINDINGS

by

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by D. Sager
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by J. E. Tolle
Report Number: OCLC/OPR/RR-83/2
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by K. Markey
Report Number: OCLC/OPR/RR-83/3
OCLC Price: $12.50; 284 pages

A Comprehensive Study of Online Public Access Catalogs: An Overview and Application of Findings; Final Report to the Council on Library Resources, Volume III
by N. K. Kaske and N. P. Sanders
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Online Public Access Catalogs: The User Interface
by C. R. Hildreth
Product Number: 801
Price: $18.00; 280 pages, paperbound

Public Library Administrators' Planning Guide to Automation
by D. J. Sager
Forthcoming

NOTE TO READER

Three volumes comprise the Final Report to the Council on Library Resources, Inc., prepared by the OCLC Office of Research.

Volume I.	Current Utilization of Online Catalogs: Transaction Log Analysis, by John E. Tolle.
Volume II.	Online Catalog Use: Results of Surveys and Focus Group Interviews in Several Libraries, by Karen Markey.
Volume III.	A Comprehensive Study of Online Public Access Catalogs: An Overview and Application of Findings, by Neal K. Kaske and Nancy P. Sanders.

In addition to these volumes, the reader may wish to consult the final reports prepared by the organizations which were also funded by the Council on Library Resources, Inc. in this online public access catalog study. Following is a list of these reports:

Research Libraries Group, Inc. Public online catalogs and research libraries: final report to the Council on Library Resources. Stanford, CA: Research Libraries Group, Inc., 1982 September.

Matthews, Joseph K. A study of six online public access catalogs: a final report submitted to the Council on Library Resources, Inc. Grass Valley, CA: J. Matthews & Associates, Inc.; 1982 November.

University of California, Division of Library Automation and Library Research and Analysis Group. Users look at online catalogs: results of a national survey of users and non-users of online public access catalogs: final report to the Council on Library Resources. Berkeley, CA: University of California; 1982 November 16.

Anderson, Rosemary; Reich, Victoria A.; Wagner, Pamela Roper; Zich, Robert. Library of Congress online public catalog users survey: a report to the Council on Library Resources. Washington, DC: Library of Congress, Office of Planning and Development; 1982 October 29.

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We also wish to express our appreciation for the efforts of the Office of Research staff for helpful criticism and for secretarial support; the Documentation Department staff for data entry, editing and making valuable suggestions on phrasing, format and style; and the OCLC General Finance Division staff for accounting advice and services.

Also, to our consultants Pauline A. Cochrane, Robert E. Burnkrant, and Paul B. Kantor, our thanks for their helpful suggestions throughout the project.

Finally, we gratefully acknowledge our debt to the participants in our study, without whom we could not have accomplished our research goals. Although the names of all who assisted us cannot be mentioned here for lack of space, we do want to recognize the administrative liaisons for their assistance: Director Donald C. Anthony, Syracuse University Libraries; Director Lolly Eggers, Iowa City Public Library; Dean Dale Carrison, Mankato State University Library; Librarian Esther Greenberg, Case Western Reserve University Library; Associate Director, Public Services, Richard Waters, Dallas Public Library; Director William J. Studer, The Ohio State University Libraries; and Robert Zich, Library of Congress. To the many others who helped us in uncounted ways (several of whom are cited in the previous two volumes), a special thanks.

A special thank you is extended to the staffs of the other principal organizations taking part in this group project, in particular Douglas Ferguson of the Research Libraries Group, Inc., Robert Zich and Rosemary Anderson of the Library of Congress, Joe Matthews of J. Matthews & Associates, and Edwin Brownrigg and Gary Lawrence of the University of California.

NOTES ABOUT THE AUTHORS

In 1980 Dr. Kaske assumed management of the Office of Research, which conducts mission-oriented research in areas of library and information science. Before joining OCLC, he spent ten years working with library reference, acquisitions, and administration systems; and he worked at the University of California, Berkeley, as a member of the Library Systems Office. His principal area of interest is developing measures of user and system behavior and evaluating user/system interaction. Dr. Kaske received a B.A. degree in sociology from Baker University, an M.L. from Kansas State Teachers College, and a Ph.D. in industrial engineering from the University of Oklahoma.

Dr. Sanders, OCLC Research Associate, received a B.A. degree in Spanish from the University of Kansas, an M.A. in library science from Denver University, and a Ph.D. in library and information science from Indiana University. She has been involved in various aspects of subject access and other library-oriented research projects at OCLC. Previous library experience includes management positions in reference, government documents, and serials at the Florida Atlantic and Arizona State University Libraries. She served as Administrative Assistant and Budget/Planning Officer at the Indiana University Library before coming to OCLC in 1979.

ABSTRACT

This report covers the background, scope, and findings of a multifaceted research project proposed to the Council on Library Resources, Inc. (CLR), and entitled "Online Public Access Systems: Data Collection and Analysis". The overall research effort was sponsored by CLR, undertaken by OCLC, and described in a three-volume final report. The ultimate goal of this project is to improve the library patrons' ability to access information through the design and enhancement of online public access catalogs (OPACs). The first part of this project describes the current use and patterns of use of OPACs through transaction log analysis (see Vol. I). The second part describes library patrons' needs and perceptions of OPACs through analysis of questionnaire data and focus group interviews (see Vol. II). The data was collected nationally in cooperation with four other organizations under similar CLR grants or contracts. Vol. III evaluates and integrates the findings about online public access catalogs to assist library decision makers when planning for the initial installation of OPACs or the enhancement of existing OPACs.

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1.0 INTRODUCTION

1.1 GOAL

The ultimate goal of this research is to improve the library patron's ability to access information through the design and enhancement of online catalogs. This multifaceted research effort has provided new insights into the library patron's perceptions about online public access catalogs (OPACs) and has improved our understanding of how OPACs are used, thus moving us closer to our goal. Just over a year ago at a symposium on online catalogs prior to the American Library Association's midwinter meeting, it was estimated that only 1% of the needed information on the subject of OPACs was available. Today, as a result of this and related studies, we are steadily increasing our knowledge about this special human-computer interaction thanks to the foresight and sponsorship of the Council on Library Resources (CLR).

Our goal, to improve the library patron's ability to access information through the design and enhancement of online catalogs, is shared by a number of library organizations. The key organization is CLR, which sponsored the OCLC research, as well as three other grants and one contract, all dealing with OPACs. These related grants and contract were awarded to (1) The Library of Congress, Office of Planning and Research; (2) University of California, Office of the Assistant Vice-President for Library Plans and Policies; (3) Research Libraries Group, Inc.; and (4) J. Matthews and Associates, Inc.

OCLC, in cooperation with the four other organizations developed survey instruments, i.e., self-administered questionnaires for users and nonusers of OPACs, to learn about patrons' perceptions of OPACs at libraries across the nation. In addition, the OCLC research team employed two other methodologies to supplement what could be learned through survey research and to provide a greater understanding of the use made of online catalogs. These two methodologies are (1) focus group interviews; and (2) transaction log analysis.

Together, the three methodologies provide a balanced perspective of online patron behavior. The self-administered questionnaires provide a large amount of data within a short period of time at low cost. This data must be validated from other sources, however, because the questionnaire responses provide little more than controlled feedback. The focus group interviews were employed to validate and to further expand on the information gathered from the questionnaires. The discussions, guided as little as possible by the researcher/moderator once the topic has been introduced, were used to test hypotheses posed by the research team concerning the use or nonuse of OPACs by library patrons and staff. The transaction log is a machine record of the interaction between computer and patron. By analyzing transaction logs we can visualize patron's input access points and discover patterns of use.

Figure 1 pictures the balancing nature of the three methodologies. When mapped on the feedback accuracy/cost efficiency continuums, the survey questionnaire falls at the low end of the accuracy scale, but the high end of the cost efficiency scale. Transaction log analysis falls at the opposite end of each scale, while the focus group interviews fall in the middle.

The three methodologies (survey research, focus group interviews, and transaction log analysis) also make it possible to address the first two of four key priorities set during the "Dartmouth Conference," a CLR-sponsored research project in 1980 which brought together the chief information professionals involved in the design, planning, implementation, and enhancement of online public access catalogs. The four priorities were: (1) analyzing user requirements and behavior; (2) monitoring existing public access systems; (3) developing methods for cost management; and, (4) developing distributed computing and system links.[4]

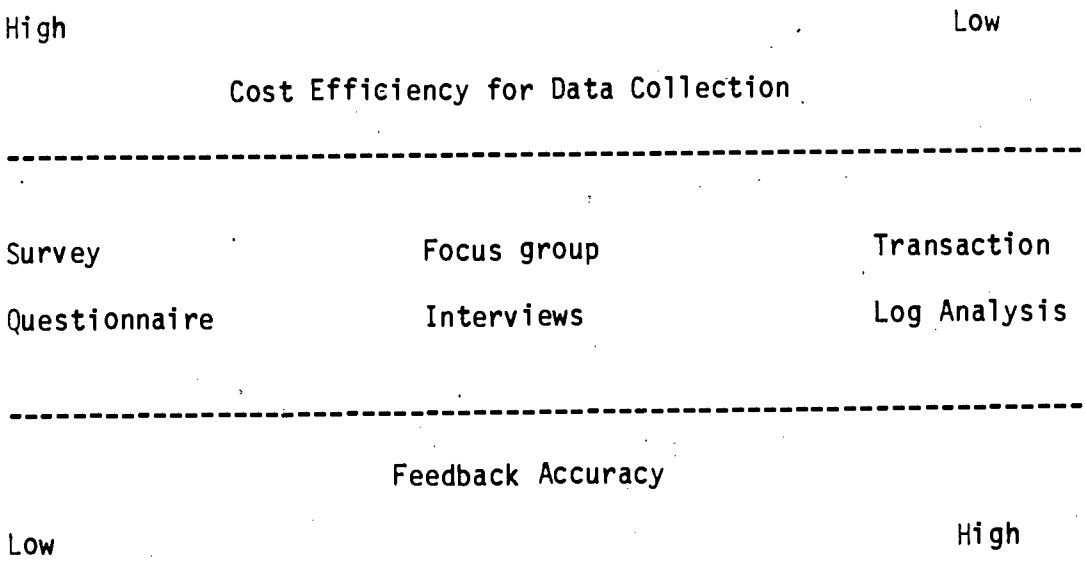
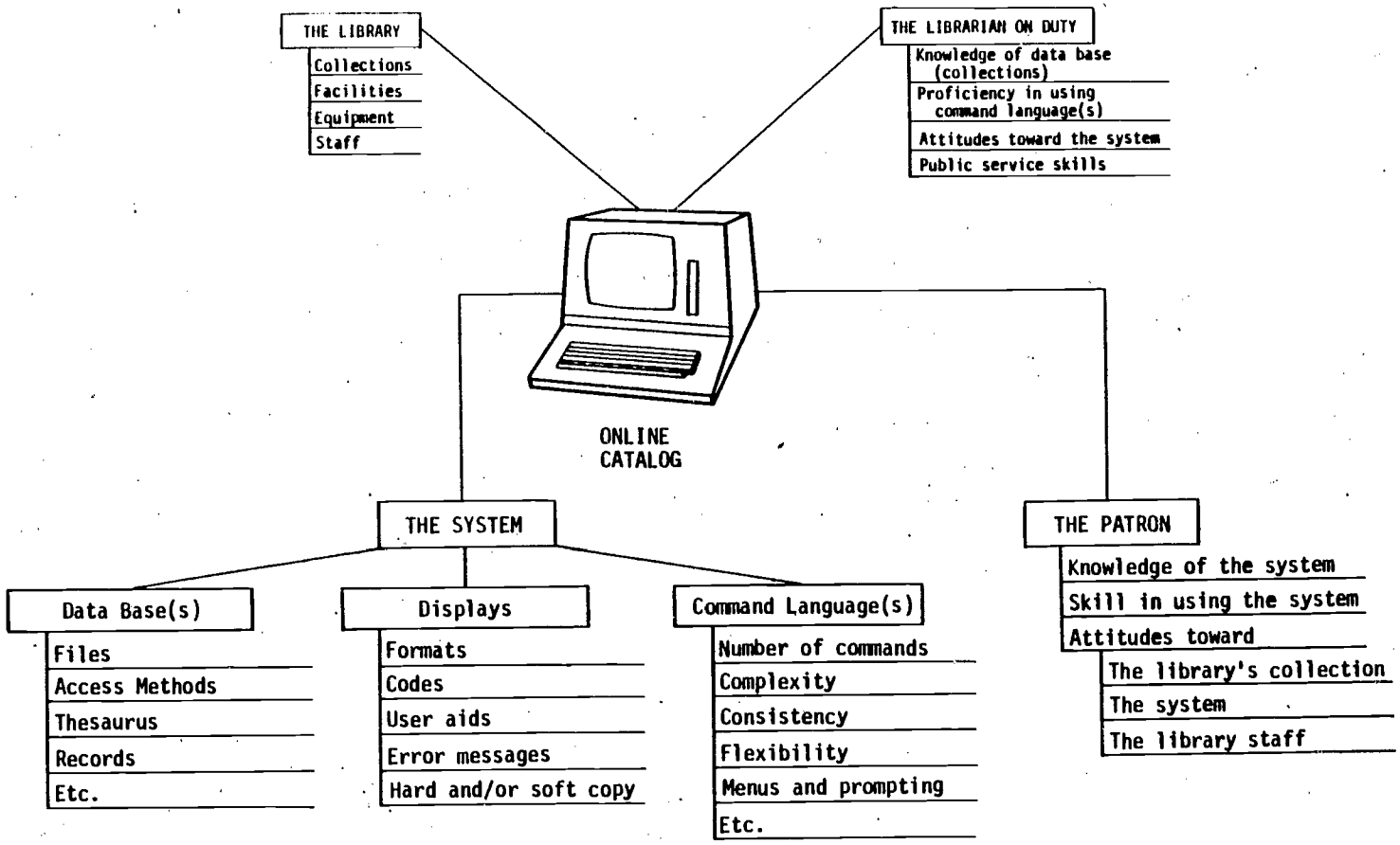


Figure 1. Feedback Accuracy Continuum

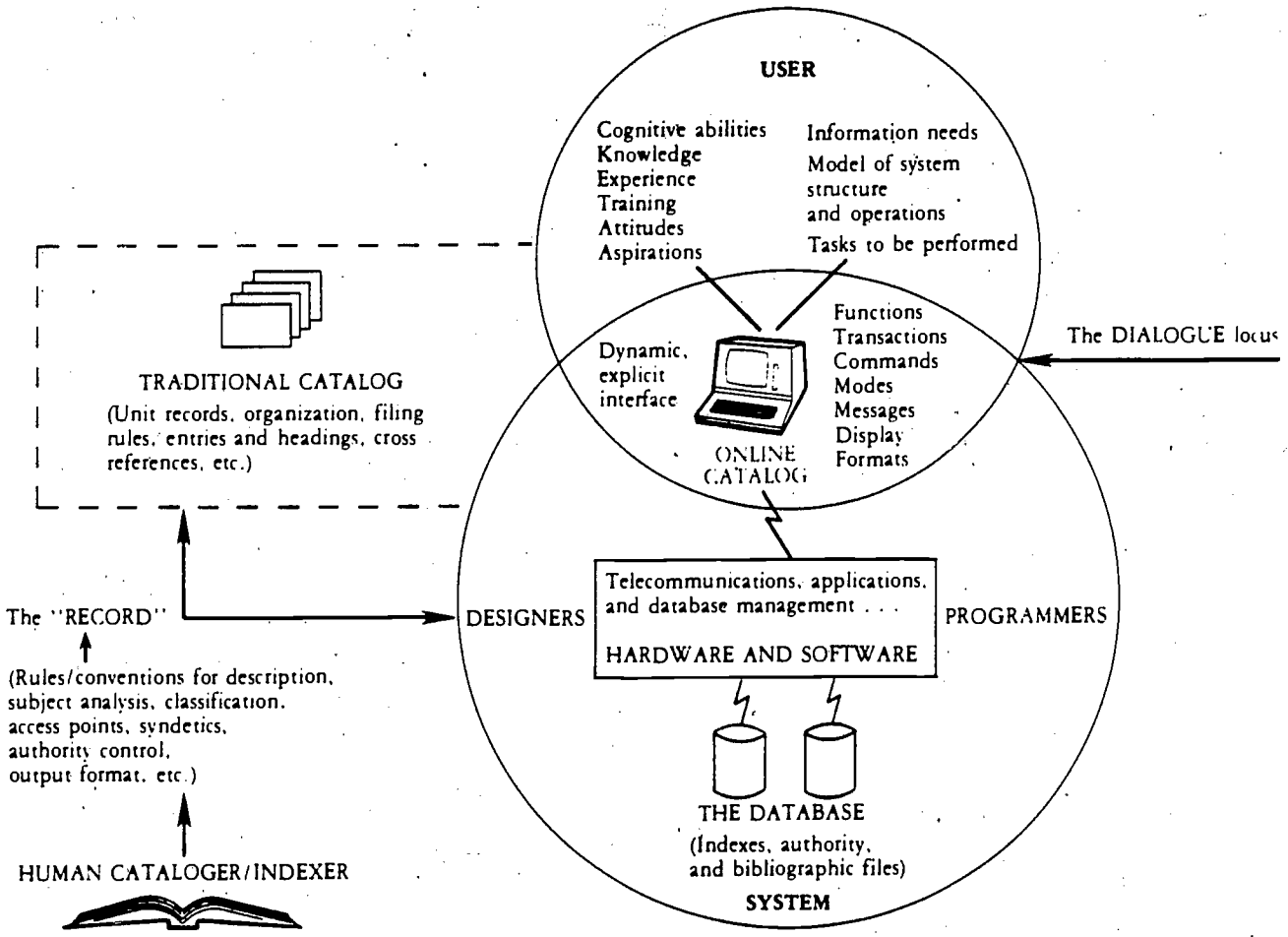
1.2 A CONCEPTUAL MODEL FOR ONLINE CATALOG RESEARCH

Several models have been constructed to aid our understanding of the human-computer interactions taking place when a library patron uses an OPAC. These models have helped identify the variables that need to be studied to bring about an understanding of the user's requirements, behaviors, and expectations for the OPACs. Figure 2 portrays a model with four major components: the library; the librarian on duty; the computer system with its database(s), displays, and dialog; and the patron. The elements listed under each of these four key components are variables we could and in some cases have selected to study. Central to the OCLC study is the interaction between the system and the patron. A model developed by Charles Hildreth (see Figure 3) clearly illustrates the user interface for an interactive system.



Note: This chart is based in part on Fenichel, Library Research 2:107-127 (1980-81), and notes of Pauline (Atherton) Cochrane.

Figure 2. Online Public Access Catalog: Factors



(Source: Hildreth, Charles R. Online public access catalogs: the user interface. Dublin, OH: OCLC; 1982. Figure 5, p.42.)

Figure 3. The User Interface in Interactive Systems

1.2.1 OCLC's Research Plan

This research project is divided into three parts. In the first, the use made of OPACs by library patrons was studied by analyzing transaction logs (Vol. I). These logs are the machine-readable records of the activity that takes place between patrons and the OPAC. They catalog the operations patrons actually performed at the terminal, not what they believed they did.

The second part of the research project studied the needs and perceptions of library patrons (see Vol. II). Two data collection methodologies were used: (1) self-administered questionnaires; and (2) focus group interviews. The third part of the project evaluated and integrated the findings from the first two parts and presented them in format and language for the nontechnician, particularly the library manager.

As a project summary, Table 1, taken from the original OCLC proposal to CLR, is presented below. It lists the parts of the project, the research questions, related studies, the research tasks, the methods to be used, and the project output. The objectives and tasks for each of the three parts follow in an outline form.

Table 1. OCLC Proposed Study of Online Public Access Catalogs

Parts	Research Questions and Related Studies	Tasks	Methods	Project Outputs
1. Study and analyze current systems' design using transaction logs.	Are sophisticated design features actually used? (Continue work on normalized commands and definitions as established in the current CLR-funded study.)	Obtain, analyze, categorize, compare, and report the current function/command utilization of several online public catalogs.	At system level, obtain gross statistical measures to establish relative use of commands within each of 10 systems. 1. Correlation analysis 2. Frequency analysis	Comparative data across systems
2. Study and analyze patterns of use (from 4 systems' daily logs).	Are similar patterns found across systems? Between online catalogs and online reference/search services? (Compare with NLM/OCLC study.)	Identify and report the individual library patron's current use patterns of online public catalogs.	Trace sequence of actions in terminal sessions to establish individual user patterns within 4 systems.	Data on patron use or different systems
3. Study and analyze patron perceptions.	How do patrons react to online catalogs? What additional or different features do patrons require?	Assess, analyze, and report the current perceptions of library users and nonusers of existing OPACs.	Focused-group interviews at 6 libraries and data from RLG/CLR study.	Data on patron perceptions of OPACs
4. Experiment: Develop an interface simulator; test new and old features.	What effect does varying interface features have on patron use of online catalogs?	Create and use experimental procedures to test various versions of online library catalogs, without redesign or interruption of existing online systems.	Use interface simulator to model and monitor OPAC features.	Data on effectiveness of OPAC features
5. Evaluate and integrate findings for management decisions.	What are the most useful features in an OPAC? How can improved OPACs be developed, tested, and implemented cost-effectively? What are the requirements for an OPAC--staff, online training and aids, equipment, and space?	Integrate and apply the findings of the above studies to develop improved online catalogs. Disseminate findings and recommendations to library managers and other OPAC designers.	Publish results, hold target-audience workshops, provide feedback to OCLC, ARL, CLR, etc.	New data, and research tool(s) for the information science field

Objectives and Tasks for Part I.
Transaction Log Analysis

Objective: To discover the extent to which current systems' features are used and patterns of use.

Task 1A Acquire activity reports from current online public catalog systems

Task 1B Categorize and analyze the activity reports

Task 1C Normalize the activity reports

Task 1D Design a format for presenting the different activity statistics

Task 1E Evaluate transaction activity logs

Task 1F Obtain transaction tapes from four systems

Task 1G Extract a sample week's activity

Task 1H Analyze typical use patterns

Task 1I Analyze transaction information

Research efforts are always limited by time and money. This project was no exception. Therefore, Tasks 1A through Task 1D were dropped from the project except where some of the information could be presented as a by-product of Tasks 1E through Task 1I.

Objectives and Tasks for Part II.
Current Perceptions of New Forms of the Library Catalog

Objective: To evaluate and eventually improve online public catalogs from an analysis of patron needs and perceptions of online catalogs.

Task 2A Train interviewers and distribute user perception questionnaires

Task 2B Coordinate the administration of the questionnaires

Task 2C Analyze the questionnaires

Task 2D Conduct focus group interviews

All of these tasks were conducted as proposed.

Objectives and Tasks for Part III. Application of Findings

Objective: There were two specific objectives stated for this segment of the project. They are: (1) application of the project findings to the design and improvement of the online public access catalog by disseminating the research results; and (2) application of the research findings to library problems related to introducing the online public access catalog.

Task 3A Disseminate findings: the change process and project reports

Task 3B Apply and evaluate results: advisory panel

Task 3C Project management: organization, schedule, and consultants

The scope of Part 3 of the project was narrowed by omitting Task 3B and cutting back in both Tasks 3A and 3C. One of the items omitted from this segment of the project, an invitational conference on various aspects of the online public access catalog, was later conducted by CLR with an expanded format. Part 3 of this project also covered the administrative components of the project as a whole.

The research design and uses of the data and information derived from this project (proposed and as completed) included the following:

1. Terminal use data from existing OPACs to show in general terms the use of OPAC systems;
2. Transaction data analysis from existing OPACs to provide information on individual patron use of the systems;
3. Patron interview and questionnaire data to provide user reactions to the systems;
4. Synthesis of findings and a translation of results into recommendations for improvements in the design of online public access catalogs;
5. Solutions for related library problems, such as number of terminals, sophistication of command system, user education, staffing, support equipment, and space required;
6. Dissemination of results to library managers, systems designers, and interested professionals through published literature, workshops, and conferences.

1.2.2 Integration with Other CLR Projects

In addition to the OCLC research, the Council on Library Resources concurrently funded four other studies on the topic of OPACs. Each of the five organizations used one research tool, the survey questionnaire, in common. (Thus, the same questionnaire was employed at 29 institutions.) The OCLC research team supplemented this method by using other methodologies, viz., focus group interviews and transaction log analysis. The reports of other organizations funded by CLR covering questionnaire results are:

1. J. Matthews and Associates, Inc. A Study of Six Online Public Access Catalogs: A Review of Findings. November 1982. [3]

2. Library of Congress. Library of Congress Online Public Access Catalog Users Survey: A Report to the Council on Library Resources. October 1982. [1]

3. Research Libraries Group, Inc. Public Online Catalogs and Research Libraries. September 1982. [5]

4. University of California, Division of Library Automation and Library Research and Analysis Group. Users Look at Online Catalogs: Results of a National Survey of Users and Nonusers of Online Public Access Catalogs. November 1982. [6]

These four reports and the three volumes of OCLC's final report will be made available through the ERIC Clearinghouse approximately six months after the date of publication.

The grant to OCLC for this project was made in two parts. The first part was an officer's grant whose results are reported in Pilot Test of the Online Public Access Catalog Project's User and Nonuser Questionnaires.[2]

Table 2 explains the integration of the CLR projects with OCLC's related research projects.

Table 2. Related OCLC Research Projects

PROJECTS	FOCUS/PURPOSE	CONTRIBUTION TO THIS PROPOSAL
Online Patron Access to Bibliographic Data Bases. Council on Library Resources, Inc. 1980 June - Aug. P.I./ N. Kaske	Studied direct access by library users to online bibliographic data bases	Needs and priorities identified for further research
*NOTE: THIS WAS THE FIRST GROUP PROJECT FUNDED BY CLR WHICH WAS A JOINT EFFORT OF OCLC AND R.L.G. D. FERGUSON WAS THE PRINCIPAL INVESTIGATOR FOR R.L.G. THE REPORT OF THIS PROJECT IS KNOWN AS THE "DARTMOUTH CONFERENCE" REPORT.		
Bibliographic Electronic Home Information Service: Channel 2000. OCLC, Inc. 1980 March to 1981 P.I./T. Harnish	Developed and tested home information service	Menu-driven system; patron access; user aids for online searching
Modeling and Evaluation of Online User Behavior. National Library of Medicine 1979 Dec. - 1981 Sept. P.I./ W. D. Penniman	Examined and modeled user behavior with online search service	Pattern analysis of user transactions on an information retrieval system
Terminal Requirements for Online Catalogs in Libraries. National Science Foundation 1979 May - 1981 Nov. P.I./ N. Kaske	Measured and analyzed four aspects of library use to predict online catalog use	Some understanding of online catalog use
Online Public Access Systems: Data Collection Instruments for Patron and System Evaluation. Council on Library Resources 1981 Jan. - June P.I./ N. Kaske; C. Hildreth, Project Manager	Summarized and analyzed functions, command capabilities, semantics, and syntax	Standard definitions and categories of commands; patron assessment tool
*NOTE: THIS WAS THE SECOND GROUP PROJECT FUNDED BY CLR WHICH WAS A JOINT EFFORT OF OCLC, R.L.G., U.C.D.L.A., AND J.R. MATTHEWS & ASSOC.		
Subject Access. 1983 Feb. OCLC, Inc. P.I./N. Kaske	Examined patrons' perceptions, expectations, and criteria for success in using subject catalog; mental processes used in subject searches	Assessment of patron problems with current methods of subject access and patron-suggested solutions; experience in using focused-group and open-ended interviews

2.0 PROJECT OVERVIEW

It is the objective of this chapter to provide a nontechnical overview of the CLR-funded OCLC study of OPACs and thereby to answer a number of basic questions about the research undertaken. Some of these questions are: What data was collected?; Why was this data collected?; How was the data analyzed?; What were the findings?

Three research tools were employed by the OCLC research team to collect the needed data on OPAC use and patterns of use: questionnaires, focus group interviews, and transaction log analysis. The first, a survey questionnaire, had the advantage of providing a large amount of data in a short period of time at low cost. The major disadvantage is that it only provides for controlled feedback. That is, respondents can answer only the questions asked and can answer those questions only within the limits of the options provided by the questionnaire.

The focus group interview, on the other hand, does not force options from the interviewers, but permits them to explore ideas in an unstructured group discussion. The researcher uses open-ended questions to initiate the discussion and then can follow up on unclear areas. Its major disadvantage is high cost and the level of interview skills required of the researcher.

Transaction log analysis is the machine-readable record of the patron's search and/or a record of the system's responses. It is a record, therefore, of what happened, not what someone remembers. The chief advantage of transaction log analysis is that it covers all basic facts of the interaction between the patron and the system. Its primary disadvantage is that few systems are currently capable of recording the interactions between the patron and the system. The monitoring creates an overhead cost in system-time and usually requires additional equipment. Furthermore, it is unlikely that most OPAC systems will provide this capability in the future as a monitoring system adds significantly to the cost of an OPAC and is advantageous, for the most part, only in systems research such as this. That is, the information provided is not particularly useful to those using or operating the system on a daily basis. When used together, the three methods provide a clear picture of OPAC use, as the disadvantages of one research tool tend to be balanced by the strengths of the others.

As implemented, the research design was somewhat more complex, though likely stronger, due to the cooperative nature of the questionnaire-related portion of the study. As noted previously, the Council on Library Resources funded four organizations, in addition to OCLC, to conduct a thorough national survey of OPAC use via questionnaire. The four other organizations are: Library of Congress, Office of Planning and Development; Research Libraries Group, Inc. (RLG); University of California, Division of Library Automation; and J. Matthews and Associates, Inc. The survey included both users and nonusers of OPACs. The questionnaires were developed by a committee composed of the principals of the five cooperating organizations. The development process was difficult at times but a useful product was generated. The printing of questionnaires was coordinated by Douglas Ferguson of RLG and Gary Lawrence of UC/DLA. The questionnaires were designed to be machine-readable and were processed at Stanford University. The basic statistical analysis was done at UC/DLA.

There were 13,591 users (i.e., patrons who had been observed using an online catalog) who were approached and asked to complete a questionnaire. Of these 13,591 some 8,094 agreed to participate and completed a user questionnaire. Some 7,625 library patrons (i.e., patrons who were observed entering the library) responded negatively when asked if they had ever used the OPAC; 3,981 agreed to participate and completed the nonuser questionnaire. A copy of the final user questionnaire distributed in the study is provided in Appendix A; a copy of the nonuser questionnaire in Appendix B. Copies of the user and nonuser questionnaires administered in the pretest are displayed in Appendixes C and D, respectively. Slightly more than 50 percent of the users and 35 percent of the nonusers who were approached completed the OCLC-administered questionnaire.

Acceptance rate and productivity data for user and nonuser questionnaires from the 9 participating libraries are reported in Tables 3 and 4. The number of patrons approached at each library and the number completing questionnaires are reported. Table 5 reports the sample size by the type of library sampled.

The organization of the OCLC efforts was divided into three parts. The transaction log analysis section was managed by Dr. John E. Tolle and is reported in Vol. I of this final report. The focus group interview and questionnaire sections were managed by Dr. Karen Markey and are reported in Vol. II. The administration and application of the findings were the responsibility of Dr. Neal K. Kaske, Principal Investigator of the project. Both Dr. Tolle and Dr. Markey were Project Managers for their respective parts of the study.

Table 3. User Questionnaire Response Rate and Productivity Data

Library or Library System	No. of Time Blocks	No. of Scheduled Hours	No. of Completed Questionnaires Per Hour	Complete	Incomplete	Total Acceptance	Decline	Total Valid	Acceptance Rate (%)	Completion Rate (%)	Response Rate (%)	No. Successfully Scanned
Syracuse University Apr. 1- Apr. 21, 1982	84	252	5.1	1286	83	1369	647	2016	68	94	64	1339
Ohio State University Apr. 6- May 28, 1982	131	393	3.5	1369	111	1480	1774	3254	45	93	42	1247
Dallas Public Library Apr. 1- May 29, 1982	198	488	2.1	1019	100	1119	349	1468	76	91	69	1081
Iowa City Public Library Apr. 5- May 29, 1982	32	67	5.8	386	33	419	136	555	76	92	70	410
University of Akron Apr. 1- May 14, 1982	54	505	.25	127	7	134	35	169	79	95	75	132
Ohio University Apr. 12- May 23, 1982	27	54	.89	48	4	52	20	72	72	92	67	51
State Library of Ohio Apr. 29- June 2, 1982	7	41	.12	5	0	5	3	8	63	100	63	5
University of Texas at Austin Apr. 5- May 14, 1982	35	261	.39	102	3	105	30	135	78	97	76	104
University of Texas at Dallas Apr. 10- May 28, 1982	14	139	.27	36	1	37	9	46	80	97	78	37
			Total User Questionnaires Accepted =			4720				Total User Questionnaires Scanned Successfully =		4406

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Table 4. Nonuser Questionnaire Response Rate and Productivity Data

Library or Library System	No. of Time Blocks	No. of Scheduled Hours	No. of Completed Questionnaires Per Hour	Complete	Incomplete	Total Acceptance	Decline	Total Valid	Acceptance Rate (%)	Completion Rate (%)	Response Rate (%)	No. Successfully Scanned
Syracuse University Apr. 2- Apr. 17, 1982	18	54	5.3	288	6	294	160	454	65	98	63	294
Ohio State University Apr. 13- May 28, 1982	16	48	5.7	275	7	282	85	367	77	98	75	282
Dallas Public Library Apr. 3- June 2, 1982	33	65	4.5	292	12	304	97	401	76	96	73	299
Iowa City Public Library Apr. 19- May 24, 1982	11	23	6.2	142	3	145	55	200	73	98	71	144
University of Akron Apr. 2- Apr. 21, 1982	4	12	8.3	100	0	100	24	124	81	100	81	100
Ohio University Apr. 10- Apr. 26, 1982	7	14	7.4	104	2	106	52	158	67	98	66	106
State Library of Ohio Apr. 10- June 2, 1982	21	80	1.1	86	0	86	37	123	70	100	70	86
University of Texas at Austin Apr. 5- Apr. 16, 1982	7	14	7.3	103	2	105	32	137	77	98	75	103
University of Texas at Dallas Apr. 14- Apr. 30, 1982	7	13	8.0	103	1	104	20	124	84	99	83	104

Total Nonuser Questionnaires Accepted = 1526

Total Nonuser Questionnaires Scanned Successfully = 1518

Table 5. Number of Questionnaires Completed by Users and Nonusers Categorized by Type of Library

Type of Library	Users Number	Users %	NonUsers Number	NonUsers %
ARL Libraries	4,701	58	1,529	38
Other Academic Libraries	661	8	764	19
Community College Libraries	155	2	228	6
State and Federal Libraries	530	7	384	10
Public Libraries	2,047	25	1,076	27
TOTAL	8,094	100	3,981	100

2.1 OBJECTIVES AND METHODOLOGIES USED IN THE PROJECT

The objective for Part 1 of this study (see Vol. I) was to discover the extent to which current systems' features are used and the patterns of their use. To focus our study in this new field of research (i.e., human-computer interaction/online public access catalogs) we posed several research questions for investigation. These questions were:

1. What is the frequency of "0 postings" searches in which searchers re-enter or revise their query?

2. Are there sophisticated searching features available to patrons (such as logical operators, word adjacency, multiple-field term searching) which are used infrequently? What correlation, if any, does type of library have with needed prompting devices or search sophistication?

3. What is the relative frequency of available fields searched?

4. What is the relationship between rigid command syntax and command usage?

5. What is the relationship between rigid command syntax and error message frequency?

6. What, if any, patterns of feature use exist, e.g., are author searches usually followed by title searches?

7. What is the comparison of user time at the terminal for subject searches to author and/or title searches?

8. What kind of relationship exists between errors and length of searches?

To answer these questions we proposed to collect data for two months at each of four different locations. In reality we were able to collect data from four locations, but were unable to obtain two months of data for each location because of the volume of transactions or the impact of transaction log analysis on individual OPACs. The locations and period of data collection are listed below.

Library of Congress	- March to June 1982
Syracuse University	- April 12 to April 28, 1982
Dallas Public Library	- August 9 to August 21, 1982
The Ohio State University	- January to December 1981, March to May 1982, and November 1982

In each of the libraries extra work was required to supply this data; in some cases a great deal of extra effort. Because of the level of effort and the compressed timing of the project, not all the data was supplied as requested. Participating libraries were very cooperative, but the creation of this data took much time and money. Ideally, available data would permit the creation of a monitor record. The data elements in this monitor record are reported in Figure 4. The first element, "session identifier," which divides the activity of one patron from another, was not directly available for any of the systems although most institutions helped to create this "session identifier." Many of the other elements were also not available but the data provided has proved to be valuable and informative. Table 6 reports each of the data elements that were available on a system by system basis.

The objective of Part 2 of this research project (see Vol. II) was to evaluate and eventually improve online public catalogs from an analysis of patron needs and perceptions of online public access catalogs. Some of the research questions answered in the investigation were:

1. How do library patrons react to online catalogs?

2. When do OPAC users prefer to use the card catalog?

3. In what ways are library patrons satisfied with their online public catalog searches?

4. What improvements are necessary to attract nonusers to search online catalogs?

5. What additional or different features do patrons require of online catalogs?

These and many other questions have been addressed by using both the questionnaires and the focus group interviews. The questionnaires were first drafted in early 1981, then pilot-tested during the fall, and distributed again in spring 1982 after revisions to the pilot-test instruments.

1. Session identifier. The unique identifier associated with the particular session being monitored.

2. User identifier. The unique identifier associated with the individual user being monitored.

3. Database or file being used. If relevant, the name of the file currently being accessed by the user in a given database.

4. Date.

5. Time stamp. The time at which each transaction occurs. Time stamps should provide as much accuracy as possible, although a time stamp resolution exceeding hundredths of a second is not generally useful. The point at which the time stamp will be applied must be specified. Ideally, the input time stamp should be applied when the user completes the input (e.g., depresses the ENTER, RETURN, or other special function key), and the output time stamp should be applied when the first character of output is delivered to the user. Since these exact times are not often available how the time stamps differ from the ideal time stamps should be stated.

6. The source of each transaction. Possible sources should include at least the terminal user, system, and other transaction source (e.g., stored command files or operator messages).

7. System-dependent state information. If other information about the transaction is readily available, it should be included. Common examples include a transaction code generated to govern internal processing or special error or return codes.

8. Blank space. This is needed for state code assignment during post-session analysis.

9. Length of text portion. Number of characters in the input or response.

10. Text portion. Contains the text of the user input or the system response. The complete text is preferred when practical, but it may be truncated.

Figure 4. Recommended Monitor Data Elements

Table 6. Summary of Empirical Data Log Elements

LIBRARY OF CONGRESS	OHIO STATE UNIVERSITY	SYRACUSE UNIVERSITY	DALLAS PUBLIC
Collected	Collected	Collected	Collected
1. Terminal ID	1. Terminal ID	1. Terminal ID	1. Terminal ID and type
2. System (SCORPIO or MUMS)	2. Start time (enter command)	2. Date	2. User commands and system responses (partially coded)
3. File searched	3. Time of system response	3. Actual command	3. Date
4. Command	4. Date	4. System Response	4. Time (in minutes)
5. Search key	5. System response (return code)		5. "Partial" begin session
6. Begins	6. Search key text		
7. Ends			
_____	Observed	_____	_____
	1. Patron start time		
	2. Sex of patron		
	3. Patron or staff		
	4. Help received from staff		
Not Collected	Not Collected	Not Collected	Not Collected
1. Time	1. Number of matches retrieved by search	1. Begin Session	1. User ID
2. (Date)	2. User ID	2. End Session	2. Some user inputs?
3. System response	3. Session end (patron end time)	3. User ID	3. All "begin" session
4. # of hits			4. Session end
5. Patron information			
Calculated	Calculated	Calculated	Calculated
1. State frequency distribution	1. Elapsed time between transactions "gap time" or "command time"	1. State frequency distribution	1. Frequency of search commands in a session
2. State chaining	2. Session length i.e., number of commands per session	2. State chaining	2. Sessions
3. Chain length and patron frequency distributions	3. Partial "session" length in elapsed time	3. Chain length and pattern frequency distributions	3. Number of terminals used each day
4. Transition probability matrices	4. "Sessions"	4. Transition probability matrices	4. Transition frequencies
5. Theoretical frequencies	5. Relative frequency of return codes	5. Theoretical frequencies	5. Chain length & pattern
6. Sessions	6. Card vs. LCS use	6. Time/session	6. Theoretical frequencies
7. Session length in number of commands per session	7. Percent of patrons obtaining help	7. Commands/session	7. Session length (time)
	8. # errors/# commands for ith command in aggregate session	8. Number of hits/search type	
	9. Return code by command	9. Error types (frequencies)	
	10. State frequency distributions	10. Sessions	
	11. Chain length and pattern frequency distribution		

2.2 DATA COLLECTION AND ANALYSIS

There were three methods of data collection employed: Survey questionnaires, focus group interviews, and transaction log analysis. The goal for each of these methods is reported in Table 7 along with the accomplishments. The questionnaires data collection was accomplished over a three-month period from April through June 1982. This was not an ideal time for most of the academic institutions since it was near the end of the term, but the timing was essential in the development of a national survey.

The questionnaire data was analyzed by the research team at UC/DLA using the SPSS (Statistical Package for the Social Sciences). The same analysis was performed with each of the library's data. A summary was done by "type of library" as researched by the five principal organizations. The values for the libraries studied by OCLC are related in Vol. II of this final report along with the aggregate values.

The data collected in the focus group interviews was done according to a discussion guide provided in Vol. II, Table 5. A focus group interview is usually conducted with 4-10 people and two researchers. One of the researchers is the discussion leader and the other helps the group process as needed and manages the audio-recording equipment. Once the interviews have been conducted, the tapes are transcribed for analysis. The analysis consists of categorizing reactions from the different groups interviewed. The groups are divided into users, nonusers, and library staff, and then further sub-categorized by type of group, e.g., students, faculty, reference staff, etc. Confidential reports of the interviews were made to each of the participating libraries. The anonymity of each individual who took part in the interview was protected. User anonymity and interviewers' skills made it possible to have very open and frank discussions with the users and nonusers of OPACs. The interviews usually lasted an hour or more. A total number of 404 people participated.

Table 7. Data Collection Goals/Accomplishments

Institutions	Questionnaires G/A User	Nonuser	Focused Group Interviews G/A	Transaction Log Analysis G/A
The Ohio State University	1500/1247	300/282	10/10	2 months/one year
Syracuse University	1500/1339	300/294	10/10	2 months/three weeks
Library of Congress	Conducted by the staff at the Library of Congress		10/16	2 months/four months
Dallas Public Library	1500/1081	300/299	10/10	2 months/two weeks
Mankato State University	Conducted by J. Matthews & Associates Inc.		10/14	Not planned
Iowa City Public	1000/410	200/144	10/10	Not planned
OCLC Libraries	1000/329	100/499	Not planned	Not planned

2.3 FINDINGS

The findings from this project are reported in all three volumes. A summary of the general findings from the questionnaire data and the focus group interviews follows. For a full report, please read Vol. II, "Online Catalog Use: Results of Surveys and Focus Group Interviews in Several Libraries." The summary results for the transaction log analysis portion of the study are also given below. For a full understanding the reader is directed to Vol. I. This chapter provides an overview of this study, while the next chapter specifically addresses its findings.

2.3.1 Summary from Volume I, Current Utilization Of Online Catalogs: Transaction Log Analysis, by John E. Tolle

A. OBJECTIVE AND GOALS

Part I of this study is concerned with the analysis of the transaction log records of online catalogs. The objective of this part of the online public access catalog study was to discover the extent to which current online catalog features are used and patterns of that use. While examining the actual catalog use, at least two goals became obvious: to obtain a better understanding of the use of online catalogs and to refine the methodologies used in carrying out any transaction analysis study.

The first goal, to obtain a better understanding of the actual online catalog use, may seem to be too large or vague, as the objective is contained within it. However, it is important to keep in mind that a valuable asset of the research is that it generates questions that were not previously considered. As such, it contributes to an understanding of the catalog use. This study has achieved this in the sense that considerable understanding of catalog use has been obtained. There is of course more to do and investigate, but we are much closer to understanding how the online catalog is used.

The second goal, to refine the methodologies, was certainly achieved. The use of transaction analysis--via development of transition probability matrices, state definitions, state diagrams, and Markov analysis--to create chains of user patterns certainly offers promise. This transaction analysis methodology is still in the early stages of refinement, however. Further refinement will occur as more systems are examined and more data is analyzed.

The scope of the transaction analysis included collecting data from four different online catalog systems. Machine-readable log tapes, which contained the user transactions in various formats and codes, were received from the following institutions: Library of Congress, Syracuse University, Dallas Public Library, and The Ohio State University. In addition, data was collected on the searching of 76 OCLC public terminals at 53 different libraries (as defined by unique OCLC location symbols). By institution type, these 53 libraries included 5 public libraries, 5 federal or state libraries, and 43 academic libraries (including several medical, health, and law libraries).

B. DATA COLLECTION

For the other online catalog systems, we obtained transaction log tapes covering the following periods:

Library of Congress	- March to June 1982
Syracuse University	- April 12 to April 28, 1982
Dallas Public Library	- August 9 to August 21, 1982
The Ohio State University	- January to December 1981, March to May 1982, and November 1982

Originally we requested two months of data from each library, but the actual data received ranged from two weeks to one full year. Using this data, samples were selected for analysis. For Syracuse University and Dallas Public Library, data was collected for two weeks, and included an examination of the representativeness of subsets of data. For Syracuse, some of the days were eliminated due to some mislabeled tapes and time consideration. For the Library of Congress, public use data was analyzed for the months of March 1982 and June 1982. April 1982 contained staff use data, and May 1982 had a mixture of both staff and public use data. These months were not analyzed since we were interested solely in patron usage. Spring quarter 1981 was used for transaction analysis at The Ohio State University because session boundaries were defined by observers stationed at the catalog.

Each online catalog system was different; therefore, the resulting transaction log tapes varied in content and format. These differences are quite extensive, and the data reduction, coding, and reformatting represented a major task within the project. It was estimated, after the fact, that in conducting any transaction log analysis, well over 50% of the effort in labor and computer time (including programming, tape reduction, and reformatting) can be attributed to this phase.

Specific data elements collected (where available) included the following: terminal identification, user commands and codes, system commands and codes, the search key, session beginning, session ending, times of user and system responses, search text, and dates.

The above list represents an ideal rather than the reality, since no OPAC system studied had all of these elements as part of the information captured on the system logs and copied to tapes for analysis. In order to appreciate the differences among the systems studied, consider that Ohio State, Syracuse, and Dallas Public did not have any session determinates, i.e., session length (when a user begins a session and then ends the session) was not captured on their systems.

The available data included manually collected start time at Ohio State, partial start time at Dallas, and start and end indications at LC. However, even though LC had "theoretical" session boundary markers, there were no time stamps on the data for time of day, nor were there any stamps indicating the date.

For Dallas, time was recorded to the nearest minute, which is insufficiently detailed for transaction analysis because patrons enter commands more often than once per minute. At Syracuse, an attempt was made to capture session beginnings by requesting certain user input, but this was often disregarded. The use of the Ohio State data from 1981 allowed session determination by coordination with observers who recorded the beginning of sessions. Since this was the only direct observation data, it was thought to be advantageous to make additional use of it even though it was originally collected for another study.

Syracuse had no user codes that were precoded. We obtained the literal use codes from the screen and had to search through the tapes until we came across the codes. System messages were also extracted in this manner.

C. METHODOLOGY

The task of analyzing the transaction tapes was broken down into the following steps:

1. Obtain the transaction tapes.
2. Check the data for validity and format; then copy them.
3. Condense the tapes by eliminating any data unnecessary to the analysis.
4. Determine sessions where possible.
5. Conduct analyses of nontransitional type (i.e., determine time and/or commands per session, etc.).
6. Build state maps using all codes.
7. Run analysis, check for problems, and condense the mapping further if required.
8. Build special maps and subsets of data.
9. Run analysis again.
10. Examine results for observations and conclusions.

The particular methodology chosen for analysis consists of first defining state codes and then developing taxonomies of these state activity codes (both user and system codes) that are mutually exclusive and exhaustive. Next, state mappings are determined that allow these state codes to be mapped into user or system states. User and system transactions are mapped into activity states. This mapping depends upon the user or system code assigned (if there is one) and also upon the context of use. The state codes represent search phases that the user is in at a given time. These were grouped according to function into one of eleven primary states, such as states representing the beginning of a session, display of bibliographic records, set creation (simple searches), help functions, combined functions, and errors that may occur.

Numerous mappings are possible for the same OPAC system. There is no one "correct" mapping; however, there may be "incorrect" mappings. For each system, a number of different mappings were made and analysis performed. At times, the output indicated the need for modifications in the selected maps. In these instances, changes were incorporated. As such, the primary mapping serves as a structure that may be applicable in varying degrees to different online catalogs.

An individual taxonomy was often further refined in a more detailed taxonomy. For example, specific display commands could be broken down into display-author, display-title, and display-subject. It is possible to break out specific error types if such error types are defined by the system under study. Similarly, certain paging commands may be associated with some specific states, but not others.

When assigning commands to specific states, the context of the search should be considered. That is, we should consider the purpose or context of its actual use. A given command may have more than one use in practice. Therefore, its intended use should be considered, in addition to the semantics of the situation, before mapping the code to a state. It may thus be possible to map a command code to more than one state, depending on the context of its use.

An example of this is shown below, using search terminology from the Library of Congress system. The third column illustrates the state mapping that would occur for an "original" map, while the right column illustrates where the code would be mapped for a "context validated" map. BGNS represents a begin session code, BRWS represents a browse code, and DISP represents a display state, while ENDS represents an end session state.

Here, the paging commands were originally mapped into a display state since they resulted in a new screen display. But, when considering the actual context of paging command use, they were being used as a browsing command (a specific bibliographic record was not being looked for in this example). Thus, these commands were mapped to a browse state (BRWS or BRW+, which means browse with explicit paging).

SEARCH CODE	SEARCH	STATE Original Map	STATE Context-Validated Maps
BGNS	LCCC	BGNS	BGNS
BRWS	PSYCHOTHERAPY	BRWS	BRWS
Ø	paging command	DISP	BRW+ or BRWS
Ø	paging command	DISP	BRW+ or BRWS
Ø	paging command	DISP	BRW+ or BRWS
ENDS		ENDS	ENDS

Once these state codes and mappings were determined, transition probability matrices and state diagrams were calculated and constructed. State transition matrices simply represent in matrix form the probability (or percentage) of going from an origin state to a destination state (e.g., the probability of starting in a display state and ending in an error state or starting in an error state and ending in a help state). The state diagrams then illustrate the frequencies (percentage) of starting in a given state and ending up in another state.

Such matrices and diagrams can be calculated for 1st, 2nd, 3rd, and higher orders, where orders are defined as the number of transitions out of the origin state. That is, a transition from display to display is 1st order, while a subject to subject to author transition is 2nd order.

D. OBSERVATIONS AND CONCLUSIONS

In attempting to draw conclusions and observations from the transaction analysis data, a number of questions were proposed and then addressed with regard to specific systems. A number of the original questions could not be answered because of the nature of the available data (e.g., time stamp not available on given systems) and data collection period. Observations and conclusions include:

The amount of time spent at the terminals was not available with any accuracy except at The Ohio State University, where it ranged from an average of approximately 4 minutes to over 9 minutes, depending on the library considered i.e. Engineering, Undergraduate, West Campus, Education or Main Library. In all cases, the time spent at terminals was higher than the time spent at card catalogs (if available) at the same institution.

Errors frequently occurred in sequence, i.e., when an error was made, there was a high tendency to make another error (.286 at Syracuse, .598 at LC, .333 at OSU). At Dallas Public, few errors were made, a situation we attribute to the format-filled system, which allows for few syntactic errors.

A number of questions are raised by the tendency to remain in an error state, including: Would help commands be useful? Are the help commands available useful?

The data indicates that, for at least three of the systems, Library of Congress, Dallas, and The Ohio State University, we are dealing with fairly homogeneous data. We cannot say with any certainty that we have a random sample, especially at Syracuse, Dallas Public, and Library of Congress. No significant difference was found in the 0th order probabilities for The Ohio State University when using spring quarter data. Similarly, the March and June data from LC were comparable, as were the 1st and 2nd week of the Dallas Public data.

These comparisons were done on simple frequencies of command usage. It is not possible to compare state chaining patterns of higher orders with any degree of confidence. We are dealing with complex chains and behaviors that are dependent on numerous, undefined variables. Indeed, even with regression analysis techniques that are well defined, it is important to note that results are very dependent on the observed data sets. Another factor is that random samples were not obtained. The systems are not designed to provide all the required data or to select random samples for analysis. Random samples would be necessary for strict sampling validity.

For LC, Syracuse, and Ohio State, the transitions of 1st and 2nd order between identical states have high probability, usually the 1st or 2nd highest probability in the transition matrices. This would seem to imply that users have a tendency to stay or return to the same state up to a chain of three commands. In addition, a detailed analysis of 2nd orders tends to confirm that they remain in the same state throughout the chain.

Search states have a tendency to go to the same states. For example, an author search tends to proceed to another author search, a subject search tends to proceed to another subject search, etc. Users seem to remain in the same search state for a long time. As previously mentioned, this also occurs for the error state.

A look at the most frequently used search types by title, author, subject, etc., yields the following:

	OSU(%) Spring 1981	DALLAS(%) April 1982	SYRACUSE(%) April 1982
Title	30.8	16.0	20.7
Subject	24.6	60.0	26.2
Author	16.8	15.0	24.0
Author/title	10.5	3.6	3.7 (Boolean)
Other	17.3	5.4	25.4

Subject searches are highest at Dallas and Syracuse, but at Syracuse, where the subject search is the highest percentage search, more sessions begin with an author search than with a subject search (25.1% compared to 21.9%). This "enhanced" number of subject searches may be attributable to users who use the search often within a session and may not be an indication of the type of search chosen. In addition, subject searches result in zero hits more than other searches, with the exception of a DUAL search (Boolean) at Syracuse. This indicates that subject searches are not a particularly successful type of search.

E. TRANSACTION ANALYSIS GOALS

In summary, transaction log analysis is an effective tool for both formulating the questions concerning the actual user behavior at online catalogs and in answering these questions. There are a number of goals in studying this behavior, including the determination of how users perceive the system, how the system fits the users' needs, and how the system is really being used. This third goal most obviously lends itself to transaction log analysis. The users' perception of the system and how it fits their needs helps to dictate how the system is actually used.

In order to approach a transaction analysis, it is first necessary to consider the system at a "lower" zero level. Next considered are first order descriptions, very simple user behaviors and system responses (e.g., whether the user hits a certain key or another key, and whether the system responds with a certain message or another message). At this point, we start collapsing strings of units that are coupled with a high probability into more comprehensive behavior descriptions. For example, one could collapse all repeated search strings together, such as author-author-author or repeated error strings. Or, one could collapse into a specific search command state with hits and another search command without hits. At this stage, the analysis is rerun (i.e., recalibrated) with new coding/state mappings, and other highly coupled states are sought.

Another use of the method of transaction analysis is to test hypotheses concerning user behavior at online catalogs, e.g., to test the hypothesis that a user tends to stay within the same search--author, subject, or title--within the same session. Other hypotheses may look at error occurrences and search frequencies.

Transaction log analysis may also be utilized to conduct basic exploratory data efforts and to generate questions that we may or may not be aware of. An example of this is the finding that the highest frequency of a search type is author search, while subject search is 2nd highest (this is only an example). Examination of the data may reveal, however, that within sessions multiple use of the author search is used much more frequently. Thus, when examining the frequencies of sessions that have specific search types, subject search may be highest.

This first online access catalog transaction log analysis study has helped to refine the goals of transaction analysis. It has also revealed some of the problems associated with conducting such a study which should be beneficial to future efforts. It has increased our knowledge of how these systems are actually being used and provides data and results with which to formulate questions and conclusions on the operation of OPACs. As such, it offers an opportunity to build upon these efforts. Transaction log analysis offers an opportunity to expand our knowledge of the actual use of OPAC systems.

2.3.2 Summary from Volume II, Online Catalog Use: Results of Surveys and Focus Group Interviews in Several Libraries, by Karen Markey

A. PROJECT OBJECTIVE

This report covers the analysis of questionnaires and focus group interviews at several libraries using online public access catalogs. The objective of the research project was to evaluate online public access catalogs (OPACs) through an analysis of patrons' needs and perceptions. The evaluation of existing OPACs is necessary to ensure that present and future development of such catalogs will lead to greater acceptance by library patrons.

B. METHODOLOGY

Self-administered questionnaires for users and nonusers of OPACs were constructed by a committee composed of the principals whose studies of OPACs were sponsored by the Council on Library Resources. The survey instruments were pretested formally and informally prior to the actual study. In spring 1982, 29 institutions took part in the administration of user and nonuser questionnaires. OCLC was responsible for questionnaire administration at the following 10 institutions:

1. University of Akron
2. Case Western Reserve University
3. Dallas Public Library
4. Iowa City Public Library
5. The Ohio State University
6. Ohio University
7. State Library of Ohio
8. Syracuse University
9. University of Texas at Austin
10. University of Texas at Dallas

The user questionnaire contained 59 questions, which were organized into the following four parts and subject areas: (1) most recent OPAC search; (2) experiences with OPAC features and services; (3) improvements to the OPAC; and (4) demographic information about the OPAC user. This questionnaire was distributed to "users" of OPACs who were defined as individuals 14 years old or older observed using the OPAC, i.e., sitting or standing in front of a terminal and touching keys or the screen, looking at a display device, etc.

The nonuser questionnaire contained 15 questions, which were organized into the following parts: (1) expectations of the OPAC; and (2) demographic

information about the OPAC nonuser. This questionnaire was distributed to "nonusers" of OPACs who were defined as individuals 14 years old or over who responded negatively to the data collector's question asking whether they had ever used the library system's OPAC.

The time blocks when users and nonusers were recruited to complete a questionnaire were randomly selected. The sampling plan was not the same from library to library but took into account each institution's calendar, hours, and special events. Data collection at Case Western Reserve University did not take place until fall 1982 and winter 1983; the results of Case Western's questionnaire administration are given in Vol. II, Appendix D. At eight of nine surveyed libraries, the acceptance rate of users exceeded 60%. The acceptance rate of nonusers equaled or exceeded 65% at all nine surveyed libraries.

Focus group interviews were used to collect information on library staff and patron needs and perceptions of online catalogs. Four groups of participants were sought for focus group interviews: (1) library patron users of OPACs; (2) library patron nonusers of OPACs; (3) reference services library staff; and (4) technical services library staff. Focus group interviews were conducted at the following six institutions:

1. Dallas Public Library
2. Iowa City Public Library
3. Library of Congress
4. Mankato State University
5. The Ohio State University
6. Syracuse University

The analysis of questionnaire data was performed at UC/DLA using SPSS to produce descriptive and nonparametric statistics. Content analysis of discussions in focus group interviews was used to construct a descriptive framework in which participants' remarks were categorized into four general areas: (1) existing system; (2) card to computer catalog transition; (3) database; and (4) user assistance (see Vol. II, Table 7). Comments of interview participants were used in this report to provide insight into and assistance in interpreting quantitative questionnaire results. Focus group interviews were also an important source of comments from groups of OPAC users and nonusers who were not surveyed because they did not match the definition of a user or a nonuser, and from members of relatively small but vocal groups, e.g., university faculty, older adults, etc., whose survey responses were overshadowed because they were represented in the population in relatively small groups in comparison with the majority of respondents.

C. DEMOGRAPHIC BACKGROUND OF SURVEYED USERS AND NONUSERS

1. Frequency of Library Visits by Library Patrons

- Differences in frequency of library visits were found between library patrons and the types of libraries they visited and between OPAC users and nonusers. Library patrons at public libraries and federal and state libraries visited the library less often than patrons at academic libraries (see Vol. II, Table 9).

- Library patrons at Syracuse, Ohio State, and OCLC-system libraries (i.e., University of Akron, Ohio University, State Library of Ohio, University of Texas at Austin, and University of Texas at Dallas) visited the library on a daily or weekly basis. Library patrons at the public libraries of Iowa City and Dallas visited the library on a weekly or monthly basis. OPAC nonusers at these five surveyed sites visited the library less frequently than users (see Vol. II, Table 10).

2. Frequency of OPAC Use

- Differences in frequency of OPAC use were found between patrons and the types of libraries they visited. Library patrons at ARL-member, academic, and community college libraries used the OPAC less frequently than public library patrons. A large percentage of first-time OPAC users were found at federal and state libraries (see Vol. II, Table 11).

- Library patrons at the public libraries of Dallas and Iowa City used the OPAC on every or almost every library visit. Patrons at Syracuse and Ohio State used the OPAC on almost every library visit or occasionally. OCLC users consulted the system less frequently than OPAC users at the four other surveyed libraries. Most likely, OCLC users consulted the system only when they could not find an item in the library's local catalog (see Vol. II, Table 12).

3. Age of Surveyed Respondents

- Differences in ages of surveyed respondents were found between library patrons and the types of libraries in which they were surveyed. Most surveyed users and nonusers represented the 15 to 19, 20 to 24, and 25 to 34 age groups (see Vol. II, Table 13).

- The ages of OPAC users and nonusers were in similar proportions in each age group, except for the high percentage of older adult public library nonusers (15%) in comparison with the corresponding low percentage of older adult public library users (4%), and the high percentage of young adult public library users (27%) in comparison with the corresponding low percentage of young adult public library nonusers (12%). Older adults in focus group interviews brought to light their intimidation by the OPAC and their perception of youngsters' flexibility, eagerness, and receptivity toward the OPAC.

4. Sex and OPAC Use-Nonuse

- With respect to the CLR-aggregate data (i.e., data collected at the 29 participating libraries), a significant relationship was found between sex and OPAC use-nonuse. In general, a greater percentage of users was male (see Vol. II, Table 15).

- With respect to the five OCLC-surveyed sites, a significant relationship was found between sex and OPAC use-nonuse at only Dallas Public Library. Statistics from Syracuse, Ohio State, Dallas Public, and OCLC-system libraries indicated that there were more female than male first-time users (see Vol. II, Table 16). Should such a trend toward female first-time use continue, percentages of male and female users might equalize in the near future.

5. Academic Background of Survey Respondents

- Percentages for the highest grade completed by survey respondents showed little difference between users and nonusers at individual libraries or types of libraries. The majority of academic library patrons were in college; public library and federal and state library patrons were college graduates (see Vol. II, Table 17).

- With respect to the five OCLC-surveyed sites, the highest grade completed by survey respondents reflected findings in the aggregate grouping by type of library. The majority of library patrons at the academic libraries of Syracuse and Ohio State were undergraduates. At the public libraries of Dallas and Iowa City, the largest proportion of library patrons were college graduates (see Vol. II, Table 18).

D. SEARCHING THE ONLINE PUBLIC ACCESS CATALOG

1. Purpose of OPAC Searches

- Differences were found in the analysis of aggregate data between the purposes of users' OPAC searches and the type of library at which they had performed their searches. At ARL-member, academic, and community college libraries, OPAC users' purposes were class-related. Personal interest was the chief purpose of public library searchers. OPAC users at federal and state libraries searched the OPAC for a variety of purposes (see Vol. II, Table 21).

- Individual libraries' statistics on OPAC users' search purposes reflected findings of the aggregate data except the purposes of OCLC-system users of which a large percentage was advanced research (see Vol. II, Table 22).

- The majority of Syracuse, Ohio State, and OCLC-system users who were undergraduates were involved in searches for class-related purposes. A large percentage of graduate student users of the Syracuse and Ohio State OPACs were also performing searches for class-related purposes. Faculty members' search purposes were related to their jobs or research (see Vol. II, Table 23).

- The main focus of OPAC users' academic work was course work, except at OCLC-system libraries, where both research and course work were the main foci (see Vol. II, Table 24).

2. Type of Information Entered into the Computer Catalog

- Multiple responses to questions about the type of information users brought to and entered into the computer catalog and the type of materials they were trying to find confounded the results. Rather than risking erroneous interpretations from such confounded data, two methods are recommended for collecting more reliable data in future studies: (1) online questionnaire administration after the completion of an OPAC search that can be captured in a transaction log; and (2) "offline" questionnaire administration after OPAC searchers' expressed thoughts are captured through protocol analysis.

3. Finding the Object of the OPAC Search

- Fewer than 20% of OPAC searchers did not find any of the desired material. The majority of OPAC users found at least "some" of the items for which they were looking (see Vol. II, Table 26).

- More very infrequent and first-time users found nothing as a result of their search than frequent OPAC users (see Vol. II, Table 27). This finding: (1) suggests that lack of proficiency in the use of OPACs may adversely affect retrievals; (2) supports the requirement that OPACs should contain features that contribute to the ease of relearning the system; and (3) suggests that OPACs contain features that assist online searchers with alternate search strategies when their searches retrieve nothing.

- In general, one of every two OPAC searchers encountered other things of interest in the course of their online search (see Vol. II, Table 28). Finding other things of interest was related to personal interest searches, a purpose characteristic of public library OPAC searchers (see Vol. II, Table 29).

4. Use of the Library's Traditional Catalog

- Use of the library's traditional catalog by library patrons was connected to: (1) the capability of the online system, e.g., union catalog, local library catalog, etc.; (2) the purpose of the patron's search; (3) the comprehensiveness of the online system's coverage with respect to the traditional catalog's coverage; and (4) combinations thereof. Should any of the first three factors change, library patrons' use of the traditional catalog would probably be affected.

E. TRANSITION FROM TRADITIONAL LIBRARY CATALOGS TO OPACS

1. General Attitudes toward OPACs

- Over 80% of surveyed users and nonusers had favorable attitudes toward the OPAC. Nonusers were less exuberant than users in their

expression of favorability (see Vol. II, Table 31). Comparable but different studies of OPACs also reported favorable responses by users and/or nonusers about OPACs.

- At this early stage in the development of computer catalogs, few users have had the opportunity to use more than one OPAC. Only about 25% of surveyed library patrons were frequent users of other computer systems (see Vol. II, Table 68). Favorable attitudes of library patrons might change in time as they have more familiarity and practice with other OPACs and computer systems and have greater powers of discrimination.

2. Favorable Attitudes toward the OPAC

- The four following reasons for favorable attitudes toward the OPAC were expressed in focus group interviews:

  a. Searching the computer catalog is fun. Especially among youngsters, young adults, and university students, searching the OPAC was more fun and less boring than searching the traditional library catalog.

  b. Searching the OPAC saves time. The computer catalog saves time in a number of ways: (1) ability to view the same information that another searcher is viewing; (2) instantaneous response of the OPAC in comparison to flipping catalog cards; (3) ability to remain in one place and search many different access points; (4) ability to access the library's catalog from remote locations, e.g., campus terminals, home terminals, etc.; (5) availability of circulation information.

  c. The OPAC provides new services. Examples of these new services are printouts of retrieved citations, ability to search the catalogs of other branch or campus libraries, and mail delivery of books to home or office.

  d. The OPAC provides new features. Examples of these new features are author/title search, limit command, and component word searching of subject-rich MARC fields.

- The three following variables were related to OPAC users' attitudes in analysis of survey questions:

  a. Finding other things of interest during the OPAC search was related to OPAC users' general attitudes toward the OPAC (see Vol. II, Table 32). For example, the percentage of users who did not find other things of interest and were unfavorable toward the OPAC was over three times greater than the percentage of users who were unfavorable toward the OPAC and did find other things of interest.

  b. Users' attitudes toward the library's other catalogs were related to their general attitudes toward the OPAC (see Vol. II,

Table 33). For example, OPAC users who felt that the OPAC was worse than the library's traditional catalog were also unfavorable toward the OPAC.

c. Frequency of OPAC use was related to users' general attitudes toward the OPAC (see Vol. II, Table 34). For example, only 6% of frequent users were unfavorable toward the OPAC, whereas 21% of infrequent users were unfavorable.

3. Unfavorable Attitudes toward the OPAC

- The three primary reasons why surveyed nonusers had not yet used the OPAC were: (1) not having taken training sessions on how to use it; (2) not having time to learn how to use it; and (3) no need to use any library catalog (see Vol. II, Table 35). Two reasons for nonuse that emerged in focus group interviews, i.e., "card catalog is easier to use" and "dislike of computers", were not highly ranked among surveyed nonusers but were reasons selected by nonusers who were very unlikely to use the OPAC in the future (see Vol. II, Table 36).

- The five following reasons for unfavorable attitudes toward the OPAC were expressed in focus group interviews:

  a. Library patrons were familiar with and trusted the traditional library catalog. Library staff could help build patrons' trust in the OPAC by making clear to patrons: (1) why the library has chosen to convert to the OPAC; (2) comparison of the traditional catalog's contents with the computer catalog's contents; (3) types of assistance available for learning how to use the OPAC; and (4) benefits of the OPAC. Such information is important to disseminate before and after the introduction of the OPAC.

  b. Library patrons feared computers or mechanical devices in general. Their fear may dissipate as the use of computers in everyday living becomes commonplace. In the meantime, a variety of online and offline user aids is suggested.

  c. Library patrons were reluctant to learn how to use the OPAC. Some of these patrons were merely "burned out" on learning, such as university students who viewed the OPAC as just one more aspect of university life that had to be learned and mastered. Other patrons, especially older adults and faculty members, were embarrassed about their lack of knowledge, which intensified when they compared their skills with those of youngsters or undergraduates. "Burned out" patrons will probably learn how to use the OPAC at the last minute before an assignment's deadline; consequently, workshops or individualized instruction must always be available, not just at fall orientation or in the first few months of the OPAC's residence in the library. Self-conscious or embarrassed patrons will probably have to be approached on an individual basis by library staff. Peer teaching by fellow faculty members was also suggested as a means of assisting reluctant faculty members.

- Statistical relationships were found between nonusers' attitudes toward the computer catalog and: (1) perceived length of time needed to learn to use the OPAC (see Vol. II, Table 37); (2) perceived difficulty of learning to use the OPAC (see Vol. II, Table 38); and (3) likelihood of future OPAC use (see Vol. II, Table 39).

4. Satisfaction with the Most Recent OPAC Search

- Over 75% of users overall and at individual libraries were satisfied with the results of their most recent OPAC search (see Vol. II, Table 40).

- Searchers who discovered other things of interest during their most recent search expressed greater degrees of satisfaction than those who had not discovered other things of interest (see Vol. II, Table 41).

- Satisfaction with the most recent OPAC search was related to OPAC users' comparisons of the OPAC with the library's other catalogs (see Vol. II, Table 42). OPAC users who were not satisfied with their search generally felt that the OPAC was worse than the library's other catalogs.

5. Changes in OPAC Users' Search Habits

- The introduction of the OPAC to the library resulted in the following changes to the search habits of OPAC users, which were voiced by library patrons and staff in focus group interviews:

  a. Library patrons enjoyed searching the computer catalog more than the traditional library catalog.

  b. Library patrons took advantage of new features and services of OPACs.

  c. Library patrons noted that the ability to remain in one place and check multiple access points increased their perseverance.

- Library patrons who noted that their search habits had not changed were performing bookshelf browsing searches in the computer catalog.

F. FEATURES OF ONLINE PUBLIC ACCESS CATALOGS

1. Review of Features in OPACs

- OPAC features were reviewed in system-by-system checklists for operational control, search formulation control, output control, and user assistance (see Vol. II, Tables 45-49).

- When checklists of OPAC features were matched with the user questionnaire, it was demonstrated that: (1) there were features

enumerated in the checklists that none of the systems in the study offered; (2) there were features in the systems studied that were not evaluated because the questionnaire did not contain questions about those features; (3) there was not a one-to-one correspondence between survey questions and OPAC features enumerated in checklists; and (4) survey questions about users' experiences with features were closed-ended.

- Focus group interviews provided a rich source for learning the nature of users' problems with OPAC features, helping to interpret survey results with regard to system features in general and disclosing users' problems with OPAC features that were not tested by the questionnaire.

2. Users' Favorable Experiences with OPAC Features (see Vol. II, Table 50)

- Search Formulation Control Features

  a. Users reported favorable experiences in connection with access points for known-item searching. The entry and amount of known-item information differed widely from system to system; however, subject access points were not listed among features with which users had favorable experiences, even though entry techniques were similar to known-item entry techniques. Thus, OPAC users' favorable experiences about known-item access points might be attributed to the concreteness of the task of finding known-items in comparison to the increased amount of mental effort involved in the task of subject searching.

  b. Focus group participants noted that the virtue of the author/title access point was its ability to pinpoint the needed item with a minimum of screen manipulations.

  c. Ohio State OPAC users cited the helpfulness of the shelf position search (SPS) to complete subject searches and/or browse the shelflist.

- Output Control Features

  a. Bibliographic and circulation record displays of the five systems studied in the survey were featured in a discussion of the ease of understanding single bibliographic record displays (see Vol. II, Figures 1-6). Individual lines of text in single record displays of the four systems with which users noted favorable experiences were prefaced by alphabetic and/or numeric labels. The use of such labels may set off lines of text to indicate to searchers differences in meaning from one labeled line of text to another.

  b. Circulation and bibliographic record displays were the chief locations of abbreviations, codes, undefined messages, jargon, etc. Focus group participants noted difficulty understanding record displays with such information. Displays and command

names should be reviewed by library staff and potential OPAC users, or be coded in such a way that would easily accommodate changes after the introduction of the OPAC to the library (see Vol. II, Figure 6).

c. Recommendations for the placement of call numbers in bibliographic record displays are: (1) placement along the outer edge of text; (2) far from the neighborhood of other numbers and characters that could be confused with call numbers; (3) labeling call numbers with a label understandable to patrons; and (4) explanations for and examples of circulation and bibliographic record displays in offline and online user aids (see Vol. II, Figures 10-12).

d. Iowa City Public's OPAC users favorably cited the memorability of the order of entering commands or the memorability of a particular command in the course of the search. The OPAC's horizontal array of touch commands might have helped patrons to remember the correct sequence of commands or the correct command (see Vol. II, Figure 13). Yet, Iowa City patrons mentioned the need for more directive means of informing them of the next and best step in the ongoing search.

- Online and Offline User Assistance

a. Syracuse University and Iowa City Public OPAC survey respondents cited their system's online user assistance. The Syracuse OPAC's directive prompts following the report of the number of retrievals helped searchers in the display of citations (see Vol. II, Figure 14). Help screens were available at all times in the Iowa City Public OPAC, but staff realized that users were embarrassed to be seen using them. The library's experience with changing the initial instructions after finding out patrons' reactions demonstrated the necessity for allowing individual libraries to alter screen displays, help messages, command names, field names, etc., after implementation of the computer catalog (see Vol. II, Figure 15).

b. OPAC users were very favorable toward librarian assistance. OCLC users and OPAC users at Ohio State noted the helpfulness of brochures about OPAC use, and Ohio State users noted that brochures were always available. Ohio State was the only library surveyed where there were always free terminals available.

3. Users' Unfavorable Experiences with OPAC Features (see Vol. II, Table 53)

- Subject Access

a. Analysis of focus group remarks and questionnaire responses showed that OPAC users experienced difficulty when performing subject searches. Reasons underlying this difficulty were: (1) patrons' inability to match their input term(s) with the OPAC's

controlled vocabulary; (2) the burden on the OPAC user of conjuring up broader or narrower terms; and (3) problems consulting the printed volumes of LCSH during the online search.

b. The following six online user aids were discussed and examples provided that were intended to help patrons select searching vocabulary, browse the OPAC, and make satisfactory relevance assessments about displayed items:

1. Alphabetical displays of subject headings (see Vol. II, Figure 16). Focus group participants pointed out that this feature has been present in searching the traditional library catalog.

2. Keyword-in-context subject heading displays (see Vol. II, Figure 17). Such displays would help searchers match their entry vocabulary with the catalog's controlled vocabulary regardless of the position of the matched term(s) in a precoordinated (or bound) subject heading.

3. Online displays of related subject headings (see Vol. II, Figure 18 and Table 54). Displays of related subject headings were the top-ranked additional OPAC feature in the survey.

4. Augmented subject access to bibliographic records. Augmented subject access to records was ranked second in the list of additional OPAC features. Of Atherton's four benefits derived from a study of augmenting bibliographic records, "the ability to answer some queries impossible using today's catalog information" was what focus group participants had in mind when they requested subject augmentation to bibliographic records (Atherton, 1978, p. iv).

5. Automatic linking of input free text terms to the OPAC's controlled vocabulary. This is already operational in the CITE and PaperChase OPACs and helps searchers to improve the recall of subject searches.

6. Inclusion of subject headings in bibliographic record displays (see Vol. II, Figure 19). This would be the alternative to mechanizing the procedure in 5. above.

- Call Number or Shelflist Searching

a. OPAC users had unfavorable experiences with the call number or shelflist displays in the Iowa City Public OPAC. Since such displays were probably used to find out if library materials were available in the library, the call number search could be simplified to reduce the number of steps (or touch commands) that are necessary to check library materials' circulation status (see Vol. II, Figures 20 and 21).

b. Ohio State users reported favorable experiences with shelflist searches and displays. Since bibliographic records entered into the Ohio State OPAC prior to June 1978 lacked subject headings, searchers used the shelf position search to improve the recall of OPAC subject searches by using the results of a subject heading search to identify a fruitful call number area. The shelf position search also allowed searchers to "browse the stacks" by perusing titles of books in the area of the input call number.

c. Focus group interview participants at all six libraries recognized the usefulness of browsing books in the neighborhood of a relevant book. Three suggestions are given to take advantage of the classifed arrangement of books:

1. Automatic feedback routine that uses class number areas of relevant retrievals to find additional items. This routine has already been implemented in CITE, a prototype OPAC at the National Library of Medicine.

2. Online Subject Guide. This reports books' class number areas, as well as the number of books found in each class number area under the subject heading of interest (see Vol. II, Figure 22).

3. Display of classification captions enumerated in classification schedules to help searchers find books on specific, coordinate, or general topics (see Vol. II, Figure 23). The need to browse subjects in context was also expressed by survey respondents when they ranked "list of related words" first among additional OPAC features.

- Reducing or Increasing Search Output

a. Questionnaire results concerning unfavorable features pointed out OPAC users' problems with reducing or increasing search output. Analysis of transaction logs (see Volume I) and focus group interviews showed that reducing or increasing search output is a widespread and prevalent problem.

b. The following recommendations are made to help searchers reduce the number of retrievals in highly posted known-item searches:

1. Suggestive or directive prompts to inform searchers to try the search using the author/title approach. In section 6.1.1 (see Vol. II), searchers championed the author/title approach as a means of pinpointing the needed item.

2. Suggestive or directive prompts to inform searchers to limit results by various criteria. Analysis of transaction data (see Volume I) showed that few searchers used limit commands, which suggests that they need to be prompted to use them.

c. The following are recommendations regarding assistance to OPAC searchers whose known-item searches result in no retrievals:

1. If the author or title approach results in no retrievals, the system produces suggestive or directive prompts informing the user to retry the search using a title or author approach, respectively.

2. When an author/title search results in no retrievals, the system suggests or directs the user to enter only title or only author information.

3. Author/title keyword searches. The Syracuse OPAC already allows author/title keyword searches. Searchers need to be prompted when to enter them.

4. Automatic truncation of title word(s) and/or author names. CITE, a prototype OPAC of the National Library of Medicine, performs automatic stemming routines on users' input words and names.

5. Spelling correction routines. Spelling correction routines have been implemented in CITE at the National Library of Medicine and BACS at the University of Washington School of Medicine.

6. Name authority control capability. The University of California's system is an example of an OPAC with name authority control.

d. Recommendations were given to help searchers reduce the output of highly posted subject searches:

1. Suggestive prompts informing users that results can be reduced by the entry of Boolean operators and additional searchable information, limit criteria, or subject subdivisions, etc.

2. Display of related word lists to help users find more specific or additional Boolean operators. The relatively infrequent use of advanced features such as Boolean operators (see Volume I) indicates the need for prompts.

3. Online Subject Guide consisting of displays enumerating the class number areas of books, as well as the number of books found in each class number area under the subject heading of interest. Searchers, especially bookshelf browsers, would be directed to the areas of the bookshelves where the majority of books under that topic are located (see Vol. II, Figure 22).

e. Recommendations for assisting OPAC users whose subject searches result in no retrievals are:

1. Cross-references online.

2. Related word lists to lead users to more general term(s).

3. Automatic truncation of users' input subject term(s).

4. Augmented subject access to bibliographic records.

5. Automatic linking of input free text terms to the OPAC's controlled vocabulary.

- Output Control Features

a. Difficulties with output control features occurred primarily in connection with entering commands. Traditional library catalog searching required a combination of mental exercise and physical skills. In OPAC searching, physical skills are "logicalized" into a series of command names or touches. OPAC searchers must always keep in mind: (1) the correct command name; (2) correct command entry procedures; (3) correct information about the display, e.g., field labels, next record number to be displayed; and (4) appropriate times to enter commands.

b. Comments in focus group interviews about command names, entry procedures, and the logical sequence of commands in online searches resulted in the following factors that must be considered in the design of output control features:

1. Mnemonic command names or abbreviations.

2. Command names or abbreviations that are easily understandable in view of the operation they perform.

3. Command entry procedures that are easy to remember.

4. Command entry procedures that are consistent from one command to the next.

5. Suggestive or directive prompts that inform users of or guide them through possible actions.

c. Problems with response time were usually specific to individual systems. Focus group interview participants were not particularly bothered by slow response times; when they anticipated slow response times, they sought ways to beat them.

d. The following output control features and the guidelines for them were drawn from an analysis and understanding of focus group participants' problems with specific OPACs' features:

1. Display forward (of single or multiple bibliographic records).

2. Display backward (of single or multiple bibliographic records).

3. Report of the number of retrieved citations or screens of titles resulting from the input of an access point.

4. Report of the number of screens required to display a full bibliographic record and/or circulation information in the first screen of the record, which:

   a. Includes a very visible and understandable directive prompt at the end of the display to guide users to successive screens of the record, or

   b. In the case of multiple, i.e., 5 or more, screens for a displayed record, includes an informative and understandable directory to the contents of multiple screens.

5. Use of messages regarding circulation status that the library can live up to.

6. Display of output ordered by a characteristic that is easily and quickly understood by users.

7. Inclusion of subject headings in brief or intermediate level displays of citations retrieved in subject searches.

- Operational and Search Formulation Control Features

  a. Users' difficulty interrupting the display of information and response time associated with displaying the next bibliographic record from a screen of records resulted in the description of a "report" key that would allow users to obtain a report of the system's progress thus far.

  b. Users' unfavorable experiences with truncation led to the two following recommendations:

     1. Automatic truncation of users' input access points when few or no records are retrieved.

     2. Natural language input of access points and system construction of derived search keys.

- Offline User Assistance

  a. At all five libraries surveyed, users reported difficulty knowing what was included in the OPAC. Following are recommendations for informing patrons about the coverage and contents of the OPAC:

     1. Workshops, group or individualized instruction, and training materials used in workshops or instruction

sessions must include a discussion of the coverage and contents of the library's OPAC.

2. Permanent printed guides or brochures about OPAC use to which searchers can refer when performing online searches at the OPAC, laminated and/or pasted to the terminal or terminal table, posted on walls, etc.

3. Free printed guides or brochures about OPAC use that are available for the taking.

4. Permanent signs posted near the library's traditional catalog must refer patrons to the OPAC to ensure that the results of their searches are up-to-date and comprehensive. A sign could say, "Check the computer catalog for books, government documents, magazines, and newspapers published after 1968."

5. Online message at the end of OPAC search could inform users that there are other resources to check; for example, an online message might say, "Check the card catalog for books, government documents, magazines, and newspapers published before 1968."

b. Excessive queuing at computer catalog terminals resulted in comments from focus group participants about the privacy of their online searches. The formation of a single queue where users stand to wait for the next available terminal is recommended to segregate patrons actually performing online searches from those waiting to perform them.

c. Focus group interviews revealed sets of patrons who refused to obtain a librarian's assistance; wanted to teach themselves how to use devices on their own time and at their own convenience; or felt embarrassed or self-conscious about referring to a brochure or manual during their online search when other library patrons were around. Such patrons would benefit from available pamphlets, brochures, or instruction sheets that they could take with them and study at their own convenience. The implementation of a number of methods of teaching patrons how to use the OPAC is very important to accommodate the variety of personal learning styles and preferences of library patrons.

d. OPAC users at four of the five libraries in the survey were eager for more computer catalog terminals in the library, in locations other than the library, and in library locations other than near the traditional catalog (see Vol. II, Table 55). Focus group interview participants were very keen on obtaining access to OPACs at home, in university offices, campus buildings, and elsewhere.

- OPAC Workstation Design Considerations

  a. OPAC users expressed problems with different types of terminals requiring different entry procedures.

  b. OPAC users' unfavorable experiences with amount of writing space and height of terminals suggest that libraries consider increasing writing space and providing chairs for OPAC searchers.

  c. Interview participants who were most concerned about comfort at computer catalog workstations were technical services and processing staff whose jobs required many continuous hours at a terminal.

  d. Few of the libraries at which surveys or interviews were completed made hardcopy printers or printed output available. Survey respondents ranked printers high in a list of the top-ranked additional OPAC features, and focus group participants were very interested in obtaining hardcopy printouts of retrieved citations.

  e. Other services and features expressed in a number of group interviews were:

     1. Same-day service for hardcopy printouts.

     2. Placement of an automatic hold on retrieved materials in circulation.

     3. Automatic delivery of library materials to patron's home or office.

     4. Designation of the location where a retrieved item is shelved.

- Enriching the OPAC's Database

  a. Journal titles were ranked first by surveyed patrons at academic and public libraries amoung library materials that should be added to the OPAC (see Vol. II, Table 56). Interview remarks demonstrated that users were referring to titles of journal articles in individual issues. Thus, patrons were interested in the addition to the OPAC of the contents of periodical indexes such as Reader's Guide to Periodical Literature, General Literature Index, and of specific subject-oriented periodical indexes, e.g., social sciences, humanities, etc.

  b. Newspaper articles, subject bibliographies, and other library reference works were mentioned by survey respondents and/or interview participants as materials they would like added to the OPAC. Patrons' interest in the addition of important reference literature to the OPAC's database suggests the implementation of

the following two OPAC features which employ the data already available in the MARC record to direct OPAC users to reference literature:

1. Mischo's (1980) rotation algorithm applied to the subject-rich fields of reference books' MARC records.

2. Analysis of the 510 fields of CONSER records (which state what periodical indexes cover the journal) through the use of an algorithm similar to one used by the PaperChase OPAC to direct users to pertinent periodical indexes, especially in highly posted OPAC searches (see Vol. II, Figure 24).

c. Focus group interview participants suggested the addition of campus or community information to the OPAC.

G. User Assistance for Searching Online Public Access Catalogs

1. Online and Offline User Assistance Provided by Participating Libraries

- The types of online and offline assistance provided to OPAC users at the nine surveyed libraries and six libraries where focus group interviews were conducted demonstrated the variety and amount of assistance available. All libraries offered the assistance of reference librarians who were stationed near the OPAC terminals. Only the Library of Congress offered a center for OPAC terminals where reference librarians' principal task was to answer inquiries about OPAC use. At other libraries, reference librarians handled both reference and OPAC-use inquiries. Nearly all libraries featured printed materials on OPAC use, which were available for reference at the terminal or for the taking (see Vol. II, Table 57).

2. Nonusers (and Why They Will Not Be Nonusers for Very Long)

- Over 75% of surveyed nonusers were likely to use the computer catalog in the future (see Vol. II, Table 59). Library patrons who would not use the computer catalog in the future had selected "card catalog easier" or "dislike computers in general" as the reasons why they had not yet used the online public access catalog. In general, the main reasons why surveyed nonusers have not yet used the OPAC are that they have not taken training sessions on use, they have not had time to learn, or they had no need to use a library catalog (see Vol. II, Table 58).

- The majority of surveyed nonusers felt that it would take less than 30 minutes to learn to use the OPAC. More nonusers at the five libraries where OCLC was the system under study than at libraries where local online access was studied (Syracuse, Ohio State, Dallas Public, Iowa City Public) thought that it would take more than 30 minutes to learn how to use OCLC (see Vol. II, Table 60). The difference between the two groups might be attributed to the perceived complexity of the OCLC terminal with its many buttons, the

paucity of patrons actually seen using the OCLC terminal, or the location of terminals in reference departments.

- A large percentage of nonusers who felt that the OPAC would be difficult to learn also felt that it would take longer than one hour to learn (see Vol. II, Table 61).

- Many current nonusers of OPACs will eventually become users regardless of the changes in libraries' methods of assisting patrons. Libraries might have to change their methods of assisting patrons to win over nonusers who feel that the card catalog is easier to use than the OPAC and who dislike computers in general, such as providing increased amount of individualized instruction, e.g., introduction of a computer catalog center similar to the one at the Library of Congress, volunteer trainers, or fostering peer teaching for reluctant and self-conscious faculty.

3. Online and Offline User Assistance

- The majority of OPAC users at all surveyed libraries first heard about the OPAC by seeing a terminal in the library. A large number of OCLC users first heard about the OPAC from the library staff (see Vol. II, Table 62).

- OCLC users and OPAC users at Dallas Public learned how to use the OPAC from library staff. In contrast, users at Syracuse and Ohio State relied primarily on printed material to learn to use the OPAC. Iowa City Public's OPAC had been cited by OPAC users for its online assistance in a discussion of OPAC features with which users had had favorable experiences (see Vol. II, Table 50). Users of Iowa City Public's OPAC learned how to use the system by consulting instructions on the terminal screen or in printed materials (see Vol. II, Table 63).

- The source of assistance employed by OCLC users and Dallas Public users in their most recent search was the library staff. Syracuse and Ohio State OPAC users consulted printed material or signs. Iowa City Public's users either did not seek help, or they followed the instructions on the terminal screen to complete their most recent search of the OPAC. The experiences of Iowa City Public patrons contrasted with that of patrons at other libraries because the former relied on the available online assistance to perform their searches (see Vol. II, Table 64).

- Comparisons of the assistance used by very frequent users of the Iowa City Public OPAC with that used by very infrequent or first-time users showed similar patterns in the sources of assistance employed (see Vol. II, Tables 65 and 66). In contrast, many first-time users and infrequent users of the Syracuse, Ohio State, Dallas Public, and OCLC systems obtained the assistance of the library staff. The findings at Iowa City Public suggested that OPAC searchers would use online assistance when it was provided; this might also reduce searchers' dependence on the library staff, especially those searchers who rarely used the OPAC or used it for the first time.

4. Recommendations for Brochures, Information Sheets, and Other Printed Materials

- Enhancements to OPACs regarding offline or online user assistance were gleaned primarily from focus group interviews. Surveyed users at Dallas Public and Ohio State called for printed materials to assist them at the computer catalog terminal (see Vol. II, Table 55). Since the latter already provided printed brochures for the taking, survey respondents probably wanted a command chart mounted on the terminal near the screen, similar to the charts on terminals at Mankato State.

- An understanding of focus group interview participants' remarks about printed materials available in their libraries led to the following guidelines about the production of printed materials:

  1. Prepare printed materials of varying lengths.

  2. Include meanings for abbreviations used in OPAC records.

  3. Show examples of the major search approaches, i.e., author, title, author/title, subject, call number.

  4. Identify field labels and field information in examples of bibliographic record displays.

  5. Avoid small print, footnotes, jargon.

  6. Highlight the basics of subject searching.

  7. Enumerate the coverage and contents of the database and tell users when they should also consult the library's other catalog(s).

  8. Pretest printed material.

5. Assistance from Library Staff

- The experiences of library staff listed below describe the range of services they provided to OPAC users who obtained their assistance:

  1. On-the-spot individual instruction.

  2. Answering reference inquiries.

  3. Getting the patron started.

  4. Troubleshooting.

  5. Group instruction.

6. Performing online searches for patrons.

7. Individualized instruction by appointment.

8. Preparation of offline user aids.

- Library patrons expressed the value of consulting the library staff about OPAC-use problems. Experiences with volunteer trainers at terminals at Dallas Public and Iowa City Public differed. Libraries considering volunteer trainers should provide workshops on at least a monthly basis to help trainers exercise their OPAC searching skills, inform them of new developments in the library's services, and teach them new OPAC enhancements or search strategies. Also, volunteers could debrief library staff about patrons' problems, which could help in the enhancement of the system or the planning of new services.

- Patrons at libraries where there were no formal OPAC workshops or classes expressed interest in attending formal training sessions. The major reason nonusers had not yet used the OPAC was that they had not yet attended training sessions on OPAC use. Thus, training sessions would probably be attended by these library patrons.

6. Online User Assistance

- The importance of online user assistance was emphasized in the comparison of user assistance sought by frequent users and by infrequent or first-time users (see Vol. II, Tables 65 and 66). The availability of online user assistance might reduce dependence on the library staff by first-time or very infrequent library users.

- The following suggestions on how to improve online assistance capabilities of OPACs were elicited from focus group interview participants:

  1. Computer-assisted instruction programs.

  2. Dialog modes for patrons based on their experience or frequency of OPAC use.

  3. Informative error messages that explain the nature of the error and how to enter the information correctly.

  4. Prompts that direct the patron to the next logical step in the ongoing search and/or suggest possible actions to take.

  5. User-oriented interface that is like a helpful companion working together with patrons to find library materials rather than working against them.

7. Relearnability of the online public access catalog was a theme that emerged in focus group interviews with library patrons and staff and is supported by statistics on the frequency of library visits, OPAC use, and

use of computer systems other than the computer catalog. Online user assistance such as computer-assisted instruction, directive and suggestive prompts, and multiple-dialog modes might be the most successful means of making sure that online public access catalogs would be easy and painless for library patrons and staff to relearn. Research with the concept of supplantation and online retrieval systems is another promising approach to solving the problem of relearnability. Improving the relearnability of existing OPACs and ensuring it in future OPACs is a key issue in the development of online public access catalogs.

3.0 APPLICATION OF FINDINGS

The extensive findings from the study are summarized below. Two methods of presentation have been selected: (1) brief, one-sentence statements generalize findings from the questionnaire, interviews, and transaction logs; and (2) specific findings are summarized in question and answer format.

3.1 BRIEF GENERALIZATIONS FROM FINDINGS

These generalizations are offered as a much simplified view of the results of the study; as such, they do not reflect the variation found among the 29 library systems surveyed. Additionally, the reader is advised to observe the following caveats: (1) although the project sample size is large, the return from some of the single library systems was small (less than 100); (2) the questionnaire has yet to be validated with repeated experimentation; and (3) the transaction log and focus group interview data, while generally validating the findings from the questionnaires, is not conclusive, as the data comes from only 4 and 6 of the 29 study institutions, respectively. With these caveats, the following generalizations are offered:

1. In all types of libraries, patrons are conducting more subject searches than most librarians generally believe they do. (And more than most previous studies have shown.)

2. "What is in the database?" is a question for which patrons do not have a clear or correct answer.

3. Patrons will use OPACs to browse tables of contents, book summaries, and books' indexes whenever we add them to the database.

4. Patrons like to have the "how to use the system" information on the terminal or right next to it.

5. The lost arts of lap-writing and writing while standing are making comebacks because the terminal work space is not always designed to provide a place to write.

6. Patrons would like to have printouts of their searches - immediately (not the next day), so that they needn't write out search results.

7. Many people do not use a catalog frequently enough to remember how to use it, so the system should have an interface specifically for the new and infrequent user as well as for the expert or frequent user.

8. Locate the terminals where people can see them, since if they see them, they will use them.

9. Some people feel the lack of privacy when using the OPAC because anyone can see what is retrieved and displayed on the screen.

10. People do not generally consult full bibliographic record displays.

11. Patrons do not like or understand many of the abbreviations used in bibliographic record and circulation record displays and with regard to command names.

12. People browse the online catalog.

13. Patrons believe the online catalog is fast and easy to learn to use even if they have not used it before.

14. A great majority of patrons learn to use the system on their own, some with a little help from a friend or the librarian.

15. Online catalogs are preferred over the card catalogs by OPAC users. (Nonusers are as yet undecided.)

16. Patrons want more items in the database such as circulation status and magazine articles.

17. More terminals are requested and some patrons want to access the OPAC from home.

18. Patron expectations are high and will be even higher in the future when they see what can be done to enhance existing OPACs and when they have had the opportunity to use more than one OPAC or online retrieval system.

3.2 SPECIFIC FINDINGS IN QUESTION AND ANSWER FORMAT

These questions were obtained from the libraries working with OCLC on this project. The questions have been categorized into logical sets for ease of reading. Where appropriate, the sections in the two major volumes of this report are noted so the reader may locate the complete discussion of the data collected. The answers provided here are therefore brief by design and are to be used with the supplemental information cited.

CATEGORY A QUESTIONS RELATED TO THE EVALUATION AND/OR DESIGN OF OPACS

Question 1. What are the differences between catalog users at different types of libraries that might influence the criteria for design and evaluation of OPACs for each type of library?

Answer There were no characteristics that differentiated catalog users at one type of library from those at another. However, within each type of library, differences did exist between frequent and less frequent OPAC users. Statistics showed that "...OPAC use was not an everyday task of library patrons at any of the five types of libraries surveyed" (Vol. II, section 7.5). Therefore, "relearnability," or the ease of relearning the use of the system, was shown to be a key element of design and evaluation in OPACs for all types of libraries. Additionally, use patterns were noted in the transaction log analysis; however, no connection between individual users and their pattern of use was possible, as user anonymity was consistently protected for the sake of privacy.

Question 2. Is it preferable to build in a separate authority or cross-reference file in an online catalog, or to make cross-referencing or linking transparent to users?

Answer Patrons prefer the cross-reference structure to be visible, though not intrusive. The switch from the term entered to the controlled term should not be transparent, but prefaced with a brief explanation. For example, the screen could read "World War 2" = "World War, 1939-1945 in this catalog". Note Vol. II, section 6.3.2.3, Online Displays of Related Subject Headings, for more information.

Question 3. How is catalog use expected to change over time in an online catalog environment? For example, will major emphasis be on known-item searching, or on subject/key word access? If the latter, how best does one approach this form of access, given the restriction of a controlled subject vocabulary designed for a card catalog? Can we bypass conventional subject access, using subject heading words in a free text environment, or should we stick to a strict use of subject access in the traditional sense?

Answer — All the data points to a high use of subject access. Term word searching or searching by subject headings alone will not be sufficient. Subject headings are needed for the collocative functions, and term searching is needed when the patron only has one term in mind. However, the uncontrolled and controlled terms should be linked. For more information, note Vol. II, section 6.3.2.5, Automatic Linking of Free Text Terms to the OPAC's Controlled Vocabulary.

Question 4. If our computer indexes are bound by data available to us, i.e., LC subject headings, should we contemplate loading thesauri of commonly used terms or term combinations?

Answer — There is a real need for a link between the controlled vocabularies and common terms, although the work will be costly. (Linkage through classification numbers would also prove helpful.) Without appropriate links, patrons will likely try one or two combinations and, assuming the library has nothing to satisfy their needs, discontinue the search. Currently research in this area is being conducted by Robert Niehoff of Battelle Memorial Institute.

Question 5. Should the online catalog simply replace the card catalog or should the circulation function be a part of it? What are the cost to benefit considerations?

Answer — Yes, the circulation function should be added. The patron will save time and probably expects that the circulation information is there anyway. This project did not address the cost or cost/benefit questions. Vol. II, section 6.3.3, Call Number or Shelflist Searching, and Vol. II, Table 54 should be consulted for additional information.

Question 6. At what point, in an attempt to respond to the more sophisticated needs of some catalog users, do we so complicate the system that it is virtually unusable by the vast majority of users? Should there be two or more versions? If so, what about cost factors?

Answer — Patrons want and will use two or more levels of a system. There are currently at least two groups of users (first timers/infrequent users and heavy daily/expert users). We may want to have three levels, one for the first timers/infrequent users, one for the once every two weeks or so user, and one for the daily/expert user. The move from one level to the next should not be noted by the patrons; they should just learn more each time they use the system. It is suggested that libraries offer a variety of online and offline user assistance to accommodate the variety of personal learning styles and preferences of OPAC users. For more information, see the following two sections in Vol. II: 7.4.2, Assistance from Library Staff, and 7.4.3, Online User Assistance. Cost factors were not addressed in this study, although it is obvious that a system designed to provide tailored service to three levels of

users would be more costly to implement and operate than a system to accommodate only one level of user expertise.

Question 7. What are the essential characteristics of the successful online catalog?

Answer We do not know the answer to this question yet. We are only beginning to learn some of the OPAC charactistics found desirable by library users; we do not yet know which are essential.

Question 8. Is there a common, essential set of characteristics of the libraries where online catalogs are successful?

Answer Some of the characteristics of the different libraries were noted, but not at the level needed to answer this question. The term 'successful' is one that needs to be defined with great care; it is so often a value judgment.

Question 9. Which online catalog has the most successful prompts? What are the characteristics that make them successful?

Answer The Iowa City Public Library patrons give high marks to the prompts in their system. The characteristics of successful prompts are outlined in Vol. II, section 6.2.3, Online User Assistance.

Question 10. What are the characteristics of a successful command package? (Cursor location, punctuation, spacing, etc.)

Answer This question cannot be answered fully as long as the term 'successful' remains undefined. Some of the factors to consider in the design of output control feature are (1) Mnemonic command names or abbreviations; (2) Common names or abbreviations that are easily understandable in view of the operation they perform; (3) Common entry procedures that are easy to remember; (4) Command entry procedures that are consistent from one command to the next; (5) Suggestive or directive prompts that inform the user, guide the user through possible actions, and explain how to carry out the actions. For more on this topic note Vol. II, section 6.3.5, Output Control Features.

Question 11. Does the online catalog display cause problems? Which of the online catalogs have the most successful (preferred) displays?

Answer Yes, online catalog displays cause problems. It is not possible to say which OPAC is the most successful or preferred in this area. But there is a good deal to report on output controls. For information in this area, see Vol. II, section 6.2.2, Output Control and section 6.3.5, Output Control Features.

Question 12. Does the inclusion in the catalog of information intended only for library staff cause problems for library patrons?

Answer — Yes. A graphic answer to this question can be seen in Vol. II, section 6.2.2, Output Control, where a record for Arthur Haley's Roots is given for four different systems. In addition, quotes from the focus group interviews are also supplied in this section.

Question 13. Does online catalog research have findings similar to earlier card catalog research, for example, the proportion of subject to known item (author/title) searches?

Answer — No. The findings from earlier card catalog studies are not similar to the findings from the online catalog study; there is a greater proportion of subject searching in online catalogs. For the percentages, see Vol. I of this report.

Question 14. What "human factors" in the OPAC environment (terminals, furniture, work space, location, access, setting) influenced OPAC use and patron satisfaction?

Answer — Patrons are very much aware of the lack of good "human factors" design in the OPAC. For example, there is little space to write or store belongings while using the catalog. Many of the systems respond in only a few seconds, then the patron often needs 15 minutes to write out the information. The result is long queues. For more information read Vol. II, section 6.3.8, OPAC Workstation Design Considerations.

CATEGORY B QUESTIONS RELATED TO USER EDUCATION/TRAINING AND PROMOTION OF OPACS

Question 1. What techniques were found to be most successful in promoting the OPAC in the libraries studied? Were they different for different categories/levels of users?

Answer — This study did not track over time the promotion of the different systems to their different patron groups. However, user assistance was addressed and information on this topic is covered in Vol. II, section 7.

Question 2. What are the best training methods for users?

Answer — We did not single out any 'best' training method. "The analysis of focus group interviews and questionnaires provided no evidence that there were right or wrong approaches to user assistance or that one approach was overwhelmingly acceptable or sufficient for assisting most OPAC users." This statement comes from Vol. II, section 7.4 of this report, Recommendations for Online and Offline User Assistance. For additional information on this question, refer to Vol. II, sections 7.4.1, Brochures, Information Sheets, and Other Printed Materials; 7.4.2, Assistance from Library Staff; and 7.4.3, Online User Assistance.

Question 3. Were planned programs of patron education judged to be effective in the libraries studied?

Answer In libraries where these planned programs were given, the patrons liked them. In libraries where they were not provided, patrons asked for them.

Question 4. What printed aids were found to be most helpful? Could printed aids be used to entice a nonuser to become an OPAC user?

Answer The printed aids that were helpful were short and to the point. This topic is covered in Vol. II, section 7.4.1, Brochures, Information Sheets, and Other Printed Materials. As for enticing the nonuser, we must first look at why people are nonusers. The five top reasons for nonuse, according to the questionnaire data, are the following: 1) I have not yet taken training sessions on use; 2) I have not had time to use it; 3) I have not needed to use any library catalog; 4) I did not know there was a computer catalog; and 5) visitor or infrequent library user. For more on the topic of the nonuser, refer to Vol. II, section 7.2, Nonusers (and Why They Will Not Be Nonusers for Very Long).

Question 5. What types of staff assistance were found to be most effective? One-on-one training? Classes? Were different types of assistance perceived more helpful (or less intrusive) by different categories of patrons?

Answer Since there are so many learning styles, it is essential to provide all types of help. This question is much like questions 1 and 2 above. For complete findings on the topic, see Vol. II, section 7.4, Recommendations for Online and Offline User Assistance.

Question 6. What are the demographics of users who are more receptive to the online catalog? Who are more resistant?

Answer The most receptive are young students and researchers who require comprehensive information. The most resistant are older people who have personal libraries. For a discussion of the user demographics note Vol. II, sections 5.2, Favorable Attitudes Toward the OPAC and 5.4, Unfavorable Attitudes Toward the OPAC.

Question 7. What differences were discovered among the users of the OPAC by subject area or department (as judged by departmental library used)?

Answer Being the first of its kind, the research design for this study required aggregation of data at a broader level. If the data collected were divided by departmental library (which it should not be), the sample size would not be sufficient to support the analysis.

CATEGORY C QUESTIONS RELATED TO PATRON USE AND ACCEPTANCE OF OPACS

Question 1. What are the characteristics of the successful versus the unsuccessful OPAC user? Of the user versus the nonuser? Of the satisfied versus the unsatisfied or dissatisfied OPAC user? How does the user judge the success of a search?

Answer All of this question cannot be answered since we have not defined successful or unsuccessful searching. We did find, however, that patrons do not always separate the success or lack of success of the search from the finding of needed information. When a patron speaks of success in the context of library use, he or she refers to satisfying an informational need, not just using a catalog correctly. See Vol. II for information (demographics, attitudes, etc.) regarding users and nonusers.

Question 2. Are there patterns in the success and/or failure of searches in the online catalog? What are the patterns? Do they differ among types of OPACs? How?

Answer With regard to search patterns, the transaction logs for a few systems show that patterns do exist. These patterns are noted for both the user who stays on the system for a time and for those who just seem to make errors. For more on this, note Vol. I.

Question 3. Can we meet the users' expectations for the new catalogs?

Answer Patrons expect a great deal, and although they are willing to give libraries some time, they may well find other information providers if we fail to meet their expectations. Vol. II, section 5.1, General Attitudes Toward the OPAC, provides a picture of the users' expectations vis-à-vis the library.

Question 4. What are the similarities and differences between the use of the online and card catalog?

Answer The data collected for this study has not been studied from this point of view yet. The questionnaires asked people to recall only their last search and did not seek comparisons.

Question 5. What is the user's next step when unsuccessful at the online catalog?

Answer This question was not formally addressed by this study. However, from the transaction log data analysis, we know that when a person makes an error using an OPAC, there is a 50% chance that his or her next action will also be an error. To follow up on this question, refer to Vol. II, sections 5.0 and 6.0.

Question 6. Who does the patron blame for an online catalog failure?

Answer — Patrons blame both the system and themselves for not getting the OPAC to work. Frustration can be read from the transaction logs, because there are sometimes four-letter messages to the library and the system when someone cannot get the OPAC to function. We also heard patrons in the focus group interviews say that they know the library had a given book but they could not get it to come up on the system.

Question 7. What are the significant differences among libraries in the acceptance of online catalogs both by library staff and by users?

Answer — This topic was not studied.

Question 8. What library support is necessary to facilitate successful patron use of the online catalog?

Answer — Vol. II, section 7.4, Recommendations for Online and Offline User Assistance, addresses this question. The key is a diversity of approaches.

Question 9. Were users generally found to have conceptualized their search well (effectively and efficiently) in system terms? Were any of the systems particularly helpful in assisting the user to formalize a search request?

Answer — This research effort did not attempt to answer this question, but the Subject Access study just completed by Dr. Markey of OCLC did address this issue. Her report, "The Process of Subject Searching in the Library Catalog: Final Report of the Subject Access Research Project," is report number OCLC/OPR/RR-83/1 in the OCLC Office of Research Report series. This and other research reports are available from ERIC and OCLC.

Question 10. Did the users generally seem aware of system capabilities and coverage?

Answer — Patrons have yet to learn to use all the OPAC capabilities. The command usage data collected in the transaction log analysis document this. For a full accounting of this, see Vol. I. Additionally, few patrons understand the content of the OPAC. Full information on this topic is addressed in Vol. II, section 6.3.7, Offline User Assistance.

Question 11. What elements of the record does the user feel are important?

Answer — This topic was not studied in this research effort. Other studies report that patrons do not understand the different parts of a bibliographical record. There is a request from patrons for a short and simple record.

Question 12. Do they understand the concept of subject headings and how they affect searching? Subject and name control? Thesauri?

Answer Some do and some do not understand subject heading, name control, and thesauri. The research suggests that we should not require this knowledge of patrons, but should build systems which supply it. For an understanding of the data collected in this area, refer to Vol. II, sections 6.3.1, Subject Access, and 6.3.2.5, Automatic Linking of Free Text Terms to the OPAC's Controlled Vocabulary.

Question 13. Were users able to locate corporate authors or government publications more easily in the OPAC than in the card catalog?

Answer This was not addressed in the study.

Question 14. Was online assistance available to the user in any of the systems--and was it used/perceived to be useful?

Answer Yes, online assistance was available and was used by the patrons. For a full explanation, refer to Vol. II, sections 6.2.3, Online User Assistance, and 7.3, Online and Offline User Assistance.

Question 15. At what point in a search would assistance be most useful?

Answer We do not have a complete answer to this question, but we do know that patrons want and need assistance when they have not found items they need or have located too many items. Vol. II, section 6.3.4, Reducing or Increasing Search Output, addresses the matter.

Question 16. What are user expectations for response time? Is response time ever too fast?

Answer This topic was not addressed specifically by this study, but other research efforts report that people do not want to wait much more than 8 to 12 seconds. For those who use systems often, response time is seldom too fast. During the focus group interviews in this research, it was noted that response time can be too fast if the patron does not know that the screen has changed. This occurs when the response to the current query is the same or almost the same as the last query and the patron does not notice the screen flicker.

Question 17. How can downtime be made minimally inconvenient to the user?

Answer This question was not specifically addressed, although comments suggested that preserving search results on the screen when the system goes down would be particularly helpful.

Question 18. Can the user distinguish downtime from slow response? If not, what can be done about it?

Answer — This was not studied. However, we have noted people 'terminal hopping' when a system goes down; that is, moving from one terminal to another looking for one that works. It may be best to post in some central spot that the system is down.

Question 19. Can the impact of the OPAC really be judged when an alternative catalog exists?

Answer — This was not studied but people have been willing to wait in line for a terminal even if the card catalog is in the next room. When users were asked to compare the OPAC to other catalogs, most said the OPAC was better. For a complete explanation, see Vol. II, Table 43 (CLR- and OCLC-Aggregates: Comparison of Library Catalogs Categorized by Users' Academic Affiliation) and Table 44 (CLR-Aggregate and Individual Libraries: Comparison of Computer and Traditional Library Catalogs).

CATEGORY D QUESTIONS RELATED TO THE IMPACT OF THE OPAC ON OTHER LIBRARY OPERATIONS AND SERVICES

Question 1. What is the impact of the online catalog on other aspects of library service? For example, on the demand for reshelving, searches, holds, reorders, etc.

Answer — There is and there will continue to be an impact on other library services. For example, if circulation data is reported on the OPAC, patrons will expect the book to be on the shelf if they note that it is available. We will need to shelve returned books very soon after their status has been changed from circulating to available. Vol. II, sections 6.3.7, Offline User Assistance, 6.3.8, OPAC Workstation Design Considerations, and 6.4, Enriching the OPAC's Database provide useful information on this topic.

CATEGORY E QUESTIONS RELATED TO THE LARGER ISSUES: HOW WILL THE OPAC AFFECT THE FUTURE OF LIBRARIES AS INSTITUTIONS/ORGANIZATIONS

Question 1. What are the implications for major changes in library service and perceptions of what the library is, as its catalog becomes widely available through terminals outside the physical library?

Answer — An essay could be written on this topic, but in general, people will expect more from their libraries. They now want more and better subject access. The personal computer revolution will soon have its effects on the OPAC, since in some cases patrons now use the OPAC from their homes and offices. One need only spend a few minutes with these reports to see that OPACs are changing our libraries.

CATEGORY F QUESTIONS RELATING TO COST AND FINANCING OF OPACS

Question 1. How will we control the costs for the use of the system and who should pay? (It is generally believed the OPAC use should be free to patrons, though the cost of that service is generally higher than that of maintaining the card catalog and related services. Should patrons be asked to "cost-share" for the new service?)

Answer This question was not addressed by this study. It is a major issue with current economic conditions and budget cutting philosophies and it will have to be addressed soon.

Question 2. How many terminals will we need to have? What operations can be cut back in other areas of the library and the attendant cost-savings used to finance the OPAC?

Answer It is possible to determine the required number of terminals if the arrival times, service volume, and pattern of use (distribution) are known. Such patterns have been determined in previous studies (e.g., Terminal Requirements for Online Catalogs in Libraries, an OCLC study sponsored by the National Science Foundation). The average service times for five OSU libraries ranged from just under 4 to just over 9 minutes. For Syracuse, the median service time was 3.55 minutes. For Dallas, the median was near 3 minutes. Vol. I, Chapter 6 (Conclusions) addresses the amount of time spent at the terminal by patrons. Refer in particular to Questions 1 and 2 in Chapter 6.

Question 3. Can the data from this study be generalized to the population as a whole?

Answer No. During this study we talked with, provided questionnaires to, and recorded the online catalog use of library patrons only. Generalizing to the population would have required that we sample from the entire population, i.e., nonlibrary, as well as, library users.

4.0 AREAS OF ADDITIONAL RESEARCH

This study marks only the beginning of the research that must be done to provide library patrons with the best online catalogs possible. The tools we have used, survey questionnaires, focus group interviews and transaction log analysis, must be used again and again over the next few years at the same and at different libraries in order to amass the knowledge needed to provide an acceptable human-computer interface. The need for this additional research is clear from the number of unanswered questions noted in section 3 of this volume. It is vital that we continue this research, share the results, and study what others in fields related to human-computer interaction are learning.

In particular, future research should follow the attitudinal changes of patrons about OPACs. We have learned that the attitudes of patrons who use computers other than the library's computer catalog are not much different from those of patrons who do not use computers other than the library's OPAC. We expect changes in attitude between these two groups as personal computers grow in popularity and everyday use. Changes in patrons' attitudes may also occur when they have had an opportunity to use more than one OPAC. Today, with as many as four different OPACs available in the libraries of one city, such a comparative study soon will be possible.

Another rich area for research is the study of transaction logs over time to see the effects of changes in a given system. For example, we have learned that some online error messages and online help screens are not particularly helpful and that patrons who make one error are very likely to make another error. When changes are made in OPACs in which transaction log data is available, we will be able to study the effectiveness of these system changes. The opportunity to monitor our modifications in an unobtrusive manner will make it possible to improve patrons' ability to access information.

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6. University of California, Division of Library Automation and Library Research and Analysis Group. Users look at online catalogs: results of a national survey of users and non-users of online public access catalogs: final report to the Council on Library Resources. Berkeley, CA: University of California; 1982 November 16.

APPENDIX A. FINAL USER QUESTIONNAIRE

Council on Library Resources

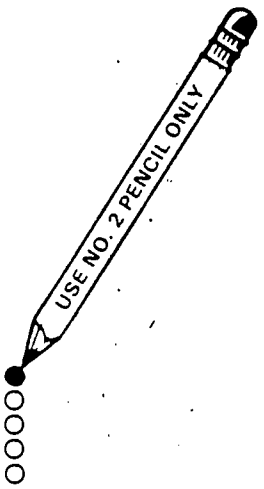
COMPUTER CATALOG STUDY

User Questionnaire

The library is conducting a study of its computer catalog to improve it. This questionnaire is a way to communicate your views. It should take you only about 15 minutes to complete. Your responses are confidential. Please do not write your name anywhere on the questionnaire. Thank you.

MARKING INSTRUCTIONS

- USE A NO. 2 PENCIL ONLY.
- FILL THE CIRCLES COMPLETELY.
- BE SURE TO ERASE CLEANLY ANY MARKS YOU WISH TO CHANGE.
- MAKE NO STRAY MARKS ON THIS QUESTIONNAIRE.



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PART 1: ABOUT YOUR MOST RECENT SEARCH

INSTRUCTIONS: Please answer these questions about the computer catalog search you just completed.

1. I came to this computer search with:
(Mark ALL that apply)

- a A complete author's name ○
- b Part of an author's name ○
- c A complete title ○
- d Part of a title ○
- e A topic word or words ○
- f A subject heading or headings ○
- g A complete call number ○
- h Part of a call number ○

2. By searching this computer catalog I was trying to find:
(Mark ALL that apply)

- a A specific book journal or magazine ○
- b Books journals or magazines on a topic or subject ○
- c Books by a specific author ○
- d Information such as publisher date spelling of a name etc ○
- e If a book that I know the library has is available for my use ○
- f Another library that has a book journal or magazine that I want ○

3. I searched for what I wanted by:
(Mark ALL that apply)

- a A complete author's name ○
- b Part of an author's name ○
- c A complete title ○
- d Part of a title ○
- e A topic word or words ○
- f A subject heading or headings ○
- g A complete call number ○
- h Part of a call number ○

4. I need this information for:
(Mark ALL that apply)

- a Recreational uses ○
- b Making or fixing something ○
- c My work or job ○
- d Personal interest ○
- e A hobby ○
- f Class or course reading ○
- g A course paper or report ○
- h A thesis or dissertation ○
- i Writing for publication ○
- j Teaching or planning a course ○
- k Keeping up on a topic or subject ○

5. In this computer search I found:
(Mark ONE only)

- a More than I was looking for ○
- b All that I was looking for ○
- c Some of what I was looking for ○
- d Nothing I was looking for ○

6. In relation to what I was looking for, this computer search was:
(Mark ONE only)

- a Very satisfactory ○
- b Somewhat satisfactory ○
- c Somewhat unsatisfactory ○
- d Very unsatisfactory ○

7. I came across things of interest other than what I was looking for:

- a YES ○
- b NO ○

8. I got help in doing this computer catalog search from
(Mark ALL that apply)

- a Printed material or signs ○
- b Instructions on the terminal screen ○
- c Library staff member ○
- d Person nearby ○
- e I did not get help ○

9. My overall or general attitude toward the computer catalog is:
(Mark ONE only)

a. Very favorable ..... ○
b. Somewhat favorable ..... ○
c. Somewhat unfavorable ..... ○
d. Very unfavorable ..... ○

10. Compared to the card, book, or microfiche catalog in this library, the computer catalog is:
(Mark ONE only)

a. Better ..... ○
b. About the same ..... ○
c. Worse ..... ○
d. Can't decide ..... ○

PART 2: YOUR EXPERIENCE WITH COMPUTER CATALOG FEATURES

INSTRUCTIONS: Mark the single column for each question that corresponds most closely to how you feel. If the statement does not apply to your experience at the computer catalog, mark the column, "Does Not Apply".

	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE	DOES NOT APPLY
11 A computer search by title is difficult	○	○	○	○	○	○
12 A computer search by author is easy	○	○	○	○	○	○
13 A computer search by subject is difficult	○	○	○	○	○	○
14 A computer search by call number is easy	○	○	○	○	○	○
15 A computer search by combined author/title is difficult	○	○	○	○	○	○
16 Remembering commands in the middle of the search is easy	○	○	○	○	○	○
17 Finding the correct subject term is difficult	○	○	○	○	○	○
18 Scanning through a long display (forward or backward) is easy	○	○	○	○	○	○
19 Increasing the result when too little is retrieved is difficult	○	○	○	○	○	○
20 Reducing the result when too much is retrieved is easy	○	○	○	○	○	○
21 Understanding explanations on the screen is difficult	○	○	○	○	○	○
22 Using codes or abbreviations for searching is easy	○	○	○	○	○	○
23 Abbreviations on the screen are easy to understand	○	○	○	○	○	○
24 Locating call numbers on the screen is difficult	○	○	○	○	○	○
25 Searching with a short form of a name or a word (truncation) is easy	○	○	○	○	○	○

	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE	DOES NOT APPLY
26 Using logical terms like AND, OR, NOT is difficult	○	○	○	○	○	○
27 Remembering the exact sequence or order of commands is easy	○	○	○	○	○	○
28 Understanding the initial instructions on the screen is difficult	○	○	○	○	○	○
29 Understanding the display for a single book, journal or magazine is easy	○	○	○	○	○	○
30 Understanding the display that shows more than a single book, journal or magazine is difficult	○	○	○	○	○	○
31 Interrupting or stopping the display of information is easy	○	○	○	○	○	○
32 Typing in exact spelling, initials, spaces and hyphens is difficult to do	○	○	○	○	○	○
33 Knowing what is included in the computer catalog is easy to remember	○	○	○	○	○	○
34 The order in which items are displayed is easy to understand	○	○	○	○	○	○
35 Displayed messages are too long	○	○	○	○	○	○

	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE	DOES NOT APPLY
36 Selecting from a list of choices takes too much time	○	○	○	○	○	○
37 Entering commands when I want to during the search process is difficult	○	○	○	○	○	○
38 The rate at which the computer responds is too slow	○	○	○	○	○	○
39 The availability of signs and brochures is adequate	○	○	○	○	○	○
40 Signs and brochures are not very useful	○	○	○	○	○	○
41 The staff advice is often not helpful.	○	○	○	○	○	○
42 It is hard to find a free terminal	○	○	○	○	○	○

YOU ARE MORE THAN HALF - WAY DONE

PART 3: IMPROVING THE COMPUTER CATALOG

INSTRUCTIONS: Select the response or responses that best reflect your views about changes that should be made in the computer catalog.

43. When I use the computer catalog terminal: (Mark YES or NO)

	YES	NO
a The keyboard is confusing to use	○	○
b There is too much glare on the screen	○	○
c The letters and numbers are easy to read	○	○
d The lighting around the terminal is too bright	○	○
e There is enough writing space at the terminal	○	○
f Nearby noise is distracting	○	○
g The terminal table is too high or too low	○	○
h The printer is easy to use	○	○

44 Select up to FOUR additional features you would like this computer catalog to have:

- a Providing step by step instructions ○
- b Searching by any word or words in a title ○
- c Searching by any word or words in a subject heading ○
- d Limiting search results by date of publication ○
- e Limiting search results by language ○
- f Ability to search by journal title abbreviations ○
- g Ability to change the order in which items are displayed ○
- h Ability to view a list of words related to my search words ○
- i Ability to search for illustrations and bibliographies ○
- j Ability to search by call number ○
- k Ability to print search results ○
- l Ability to search a book's table of contents summary or index ○
- m Ability to know if a book is checked out ○
- n Ability to tell where a book is located in the library ○
- o None ○

45. Select up to FOUR computer catalog service improvements you would like the library to make:

- a More terminals ○
- b Terminals at locations other than near the card catalog ○
- c Terminals at places other than library buildings ○
- d A chart of commands posted at the terminal ○
- e A manual or brochure at the terminal ○
- f An instruction manual for purchase ○
- g Training sessions ○
- h Slide tape cassette training program ○
- i None ○

46 Select up to FOUR kinds of material you would like to see added to the computer catalog:

- a Dissertations ○
- b Motion picture films ○
- c Government publications ○
- d Journal or magazine titles ○
- e Maps ○
- f Manuscripts ○
- g Music scores ○
- h Newspapers ○
- i Phonograph records or tapes ○
- j Technical reports ○
- k More of the library's older books ○
- l None ○
- m Other ○

47. BRIEFLY DESCRIBE ANY OTHER PROBLEMS WITH THIS COMPUTER CATALOG OR CHANGES YOU WOULD LIKE MADE TO IT: ○

PART 4: ABOUT YOURSELF

INSTRUCTIONS: Your responses are confidential. Please do not write your name anywhere on this questionnaire.

48. I come to this library:

- a Daily
- b Weekly
- c Monthly
- d About four times a year
- e About once a year
- f Not before today

49. I use this computer catalog:

- a Every library visit
- b Almost every visit
- c Occasionally
- d Rarely
- e Not before today

50. I use this library's book, card or microfilm catalog:

- a Every visit
- b Almost every visit
- c Occasionally
- d Rarely
- e Never

51. I use a computer system other than the library's computer catalog.

- a Daily
- b Weekly
- c Monthly
- d About four times a year
- e About once a year
- f Never

52. I first heard about this computer catalog from: (Mark ONE only)

- a Noticing a terminal in the library
- b Library tour orientation or demonstration
- c An article or written announcement
- d A course instructor
- e A friend or family member
- f Library staff

53. I learned how to use this computer catalog: (Mark ALL that apply)

- a From a friend or someone at a nearby terminal
- b Using printed instructions
- c Using instructions on the terminal screen
- d From the library staff
- e From a library course or orientation
- f From a slide tape/cassette program
- g By myself without any help

54. My age group is:

- a 14 and under
- b 15 19 years
- c 20 24 years
- d 25 34 years
- e 35 44 years
- f 45 54 years
- g 55 64 years
- h 65 and over

55 I am:

- a Female
- b Male

56 Mark your current or highest educational level: (Mark ONE only)

- a Grade School or Elementary School
- b High School or Secondary School
- c Some College or University
- d College or University Graduate

If you are not completing this questionnaire at a college or university, please stop here. Thank you.

If you are completing this questionnaire at a college or university, please continue.

57. The category that best describes my academic area is: (Mark ONE only)

- a Arts and Humanities
- b Physical/Biological Sciences
- c Social Sciences
- d Business Management
- e Education
- f Engineering
- g Medical Health Sciences
- h Law
- i Major not declared
- j Interdisciplinary

58. The main focus of my academic work at the present time is:
(Mark ALL that apply)

- a. Course Work ○
- b Teaching ○
- c Research ○

59. My present affiliation with this college or university is:

- a Freshman/Sophomore ○
- b. Junior/Senior ○
- c. Graduate - masters level ○
- d Graduate - doctoral level ○
- e Graduate - professional school ○
- f. Faculty ○
- g Staff ○
- h Other ○

Thank you for participating in this study of the computer catalog. This completes the questionnaire. Please return it.

SUPPLEMENTARY QUESTIONNAIRE ITEMS

60 ○○○○○○○○○○○○○○○○○○○○
61 ○○○○○○○○○○○○○○○○○○○○
62 ○○○○○○○○○○○○○○○○○○○○
63 ○○○○○○○○○○○○○○○○○○○○
64 ○○○○○○○○○○○○○○○○○○○○

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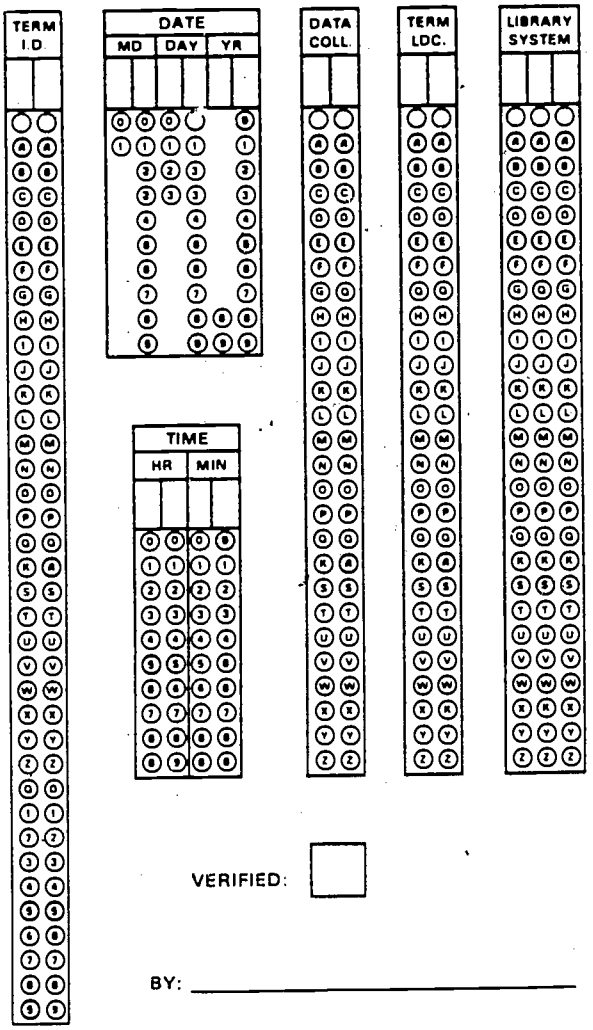

VERIFIED: ☐

BY: _____

DATE: _____

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APPENDIX B. FINAL NONUSER QUESTIONNAIRE

Council on Library Resources

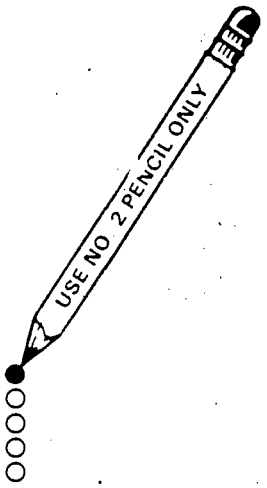
COMPUTER CATALOG STUDY

Questionnaire

The library has a computer catalog and not everyone has had a chance to use it yet. If you have NEVER USED THE COMPUTER CATALOG you can contribute to the quality of library services by completing this questionnaire. It takes about five minutes. Your responses are confidential. Please do not write your name anywhere on the questionnaire. Thank you.

MARKING INSTRUCTIONS

- USE A NO. 2 PENCIL ONLY
- FILL THE CIRCLES COMPLETELY.
- BE SURE TO ERASE CLEANLY ANY MARKS YOU WISH TO CHANGE.
- MAKE NO STRAY MARKS ON THIS QUESTIONNAIRE



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DO NOT WRITE IN THIS AREA

PART 1: WHAT YOU THINK ABOUT THE COMPUTER CATALOG

INSTRUCTIONS: Please mark the response that best describes how you view a computer catalog.

1. I have not used the computer catalog up to now because:
(Mark ALL that apply)

a I do not like to use computers ○
b I did not know there was a computer catalog ○
c I do not know where it is ○
d I have not had time to learn to use it ○
e I have not taken training sessions on how to use it ○
f There has not been any staff at the terminals to assist me in using it ○
g The terminals were all in use when I wanted to use it ○
h I have not needed to use any library catalog recently ○
i The card catalog is easier to use ○
j The card catalog contains more of the information I need ○
k I am a visitor or infrequent user of this library ○

2. How much time do you think it takes to learn to use the computer catalog?

a A day or more ○
b Between 1 2 of a day and a day ○
c Between an hour and 1 2 of a day ○
d Between 30 minutes and an hour ○
e Between 15 minutes and 30 minutes ○
f 15 minutes or less ○

3 How difficult or easy do you think it would be to learn to use the computer catalog?

a Very difficult ○
b Somewhat difficult ○
c Somewhat easy ○
d Very easy ○

4. My overall or general attitude toward the computer catalog is:

a Very favorable ○
b Somewhat favorable ○
c Somewhat unfavorable ○
d Very unfavorable ○

5. How likely are you to use the computer catalog in the future?

a Very likely ○
b Somewhat likely ○
c Somewhat unlikely ○
d Very unlikely ○

6. Compared to the card., book. or microfiche catalog in this library the computer catalog is.
(Mark ONE only)

a Better ○
b About the same ○
c Worse ○
d Can't decide ○

PART 2: ABOUT YOURSELF

INSTRUCTIONS: Your responses are confidential. Please do not write your name anywhere on this questionnaire.

7. I come to this library:

a Daily ○
b Weekly ○
c Monthly ○
d About four times a year ○
e About once a year ○
f Not before today ○

8 I use this library's book. card or microfilm catalog.

a Every visit ○
b Almost every visit ○
c Occasionally ○
d Rarely ○
e Not before today ○

9. I use a computer system other than the library's computer catalog.

a Daily ○
b Weekly ○
c Monthly ○
d About four times a year ○
e About once a year ○
f Never ○

10. My age group is:

a 14 and under ○
b 15 - 19 years ○
c 20 - 24 years ○
d 25 - 34 years ○
e 35 - 44 years ○
f 45 - 54 years ○
g 55 - 64 years ○
h 65 and over ○

11. I am

a Female ○
b Male ○

12. Mark your current or highest educational level: (Mark ONE only)

a Grade School or Elementary School ○
b High School or Secondary School ○
c Some College or University ○
d College or University Graduate ○

If you are not completing this questionnaire at a college or university, please stop here. Thank you.

If you are completing this questionnaire at a college or university, please continue.

13. The category that best describes my academic area is: (Mark ONE only)

a Arts and Humanities ○
b Physical/Biological Sciences ○
c Social Sciences ○
d Business/Management ○
e Education ○
f Engineering ○
g Medical/Health Sciences ○
h Law ○
i Major not declared ○
j Interdisciplinary ○

14. The main focus of my academic work at the present time is: (Mark ALL that apply)

a Course Work ○
b Teaching ○
c Research ○

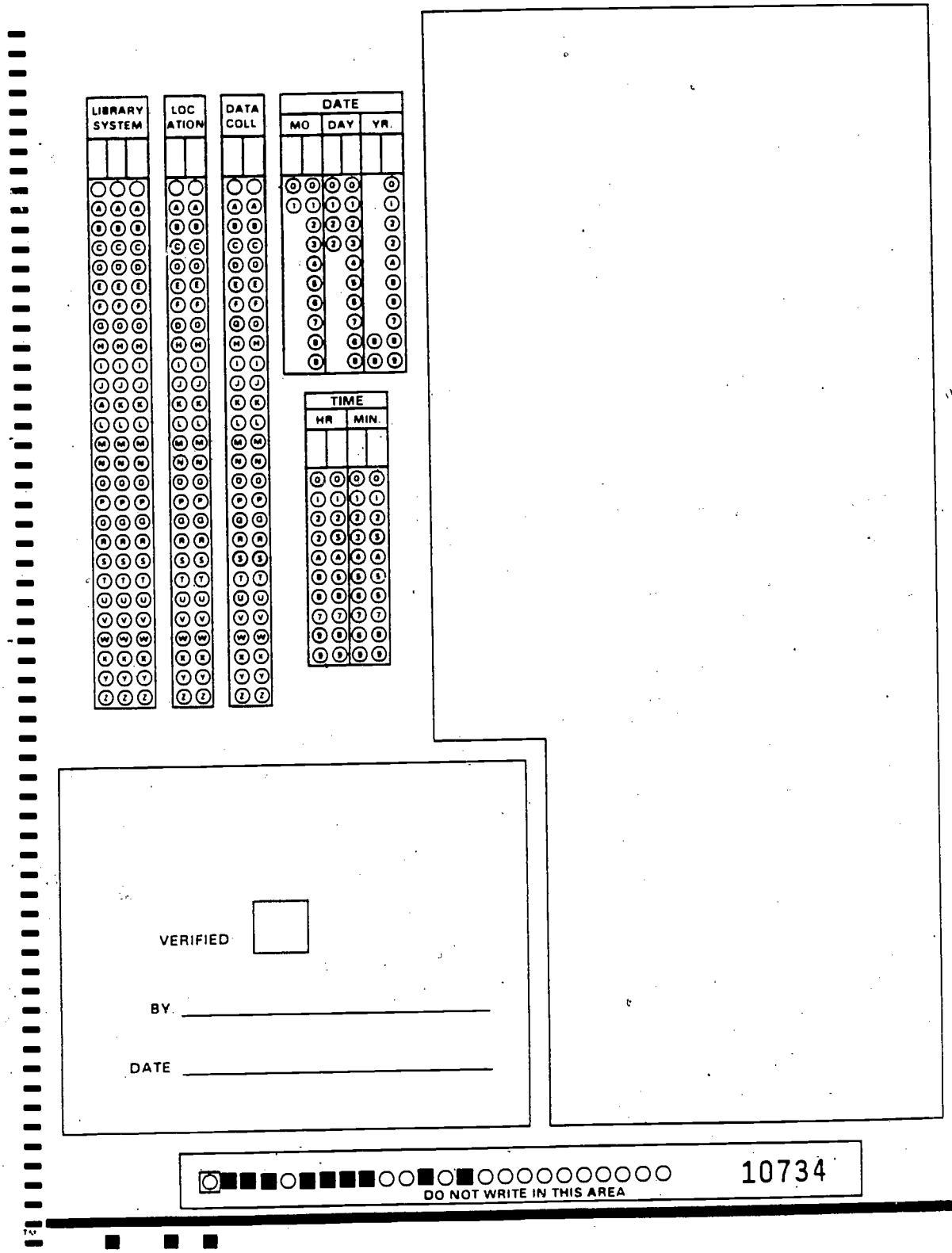
15. My present affiliation with this college or university is:

a Freshman/Sophomore ○
b Junior/Senior ○
c Graduate - masters level ○
d Graduate - doctoral level ○
e Graduate - professional school ○
f Faculty ○
g Staff ○
h Other ○

Thank you for participating in this study of the computer catalog. This completes the questionnaire. Please return it.

SUPPLEMENTARY QUESTIONNAIRE ITEMS

16. ○○○○○○○○○○○○○○○○
17. ○○○○○○○○○○○○○○○○
18. ○○○○○○○○○○○○○○○○
19. ○○○○○○○○○○○○○○○○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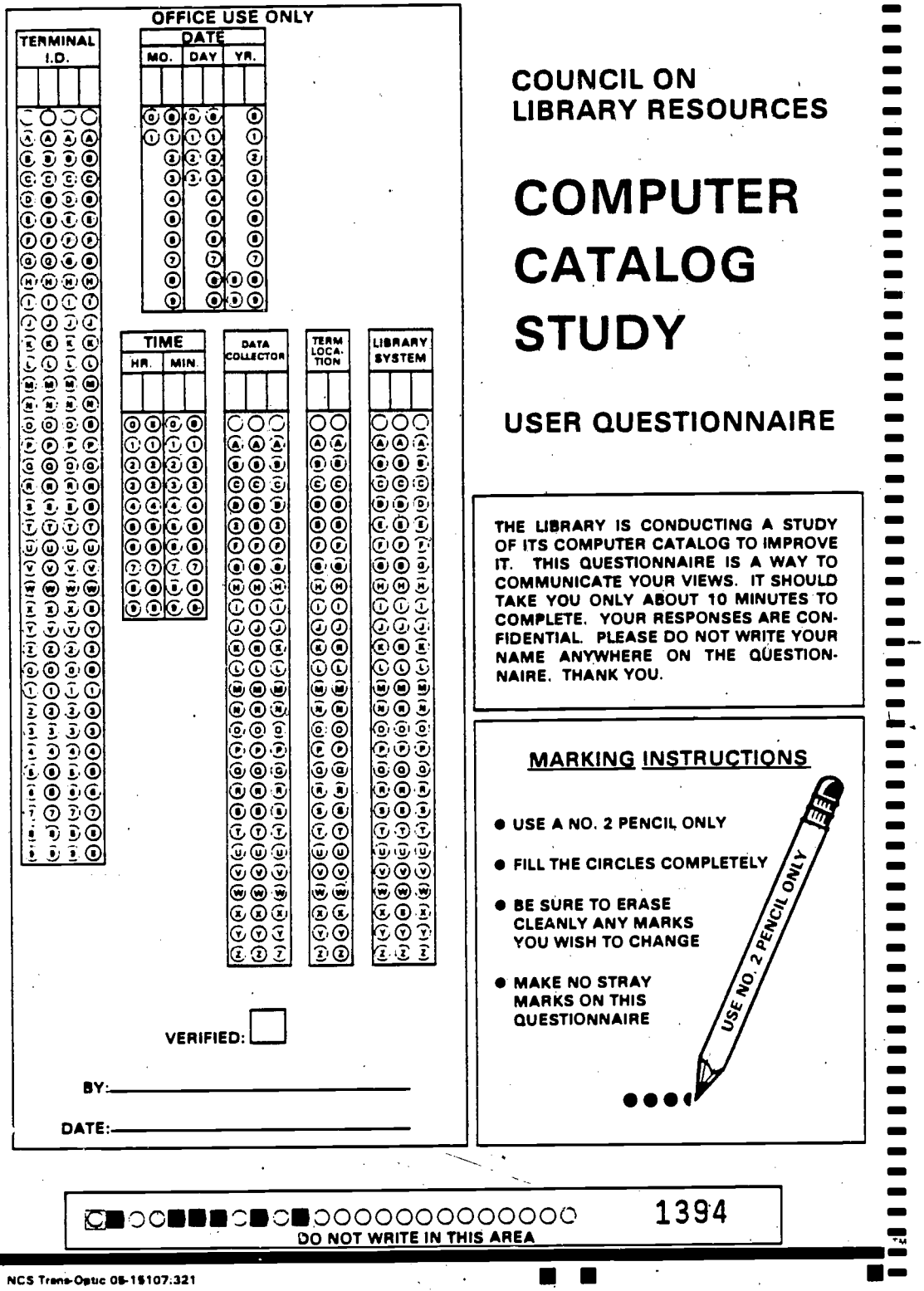
APPENDIX C. PRETEST USER QUESTIONNAIRE



PART 1: ABOUT YOUR MOST RECENT SEARCH

INSTRUCTIONS: Please answer these questions with respect to the LAST TIME you used the computer catalog.

1. I CAME TO THE SEARCH WITH:
(Mark all that apply)

- a. A complete author's name
- b. Part of an author's name
- c. A complete title
- d. Part of a title
- e. A topic word(s)
- f. A subject heading(s)
- g. A complete call number
- h. Part of a call number
- i. Other:

2. BY SEARCHING THE COMPUTER CATALOG I WAS TRYING TO FIND:
(Mark all that apply)

- a. A specific book, journal or magazine
- b. Books, journals or magazines on a topic
- c. Books by a specific author
- d. Information such as publisher, date, spelling of a name, etc.
- e. If a book that I know the library has is on the shelf
- f. Another library that has a book, journal or magazine that I want
- g. What it is like to use the computer catalog
- h. Other:

3. I SEARCHED FOR WHAT I WANTED BY:
(Mark all that apply)

- a. A complete author's name
- b. Part of an author's name
- c. A complete title
- d. Part of a title
- e. A topic word(s)
- f. A subject heading(s)
- g. A complete call number
- h. Part of a call number
- i. Other:

4. I NEED THIS INFORMATION FOR:
(Mark all that apply)

- a. Recreational uses
- b. Making or fixing something
- c. My work or job
- d. Personal interest
- e. A hobby
- f. Class or course reading
- g. A course paper or report
- h. A thesis or dissertation
- i. Writing a paper, article or book
- j. Teaching or planning a course
- k. Keeping up on a topic or subject

5. IN THIS SEARCH I FOUND:
(Mark one only)

- a. More than I was looking for
- b. All or most of what I was looking for
- c. Some of what I was looking for
- d. Nothing I was looking for

6. IN RELATION TO WHAT I WAS LOOKING FOR, THE SEARCH WAS:
(Mark one only)

- a. Very satisfactory
- b. Somewhat satisfactory
- c. Somewhat unsatisfactory
- d. Very unsatisfactory

7. I CAME ACROSS THINGS OF INTEREST OTHER THAN WHAT I WAS LOOKING FOR:

- a. Yes
- b. No

8. IN ADDITION TO THIS COMPUTER CATALOG SEARCH I HAVE ALSO USED OR WILL USE:
(Mark all that apply)

- a. A card, book or microfilm catalog
- b. Printed indexes
- c. None of the above
- d. Other:

9. I GOT HELP IN DOING THIS COMPUTER CATALOG SEARCH FROM:
(Mark all that apply)

- a. I did not get help
- b. Printed material or signs
- c. Instructions on the terminal screen
- d. Library staff member
- e. Person nearby

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10. MY OVERALL OR GENERAL ATTITUDE TOWARD THE COMPUTER CATALOG IS:
(Mark one only)
a. Very favorable .....
b. Somewhat favorable .....
c. Somewhat unfavorable .....
d. Very unfavorable .....

11. HOW LIKELY ARE YOU TO USE THE COMPUTER CATALOG IN THE FUTURE?
a. Very likely .....
b. Somewhat likely .....
c. Somewhat unlikely .....
d. Very unlikely .....

PART 2: YOUR EXPERIENCE WITH COMPUTER CATALOG FEATURES

INSTRUCTIONS: If you strongly agree with a statement, mark the "STRONGLY AGREE" column. If you strongly disagree, mark the "STRONGLY DISAGREE" column. If you agree but not strongly, or disagree but not strongly, mark either the "AGREE" or the "DISAGREE" column depending on which corresponds to your opinion. If you neither agree at all nor disagree at all, mark the center "NEITHER AGREE NOR DISAGREE" column. Remember to mark the single column for each question that corresponds most closely to how you feel. If the statement does not apply to your experience at the computer catalog, mark the column, "DOES NOT APPLY".

	DOES NOT APPLY	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
REMEMBERING THE CORRECT WAY TO ENTER:						
12. A title search is difficult	SA	AG	N	DA	SD	NA
13. An author search is easy	SA	AG	N	DA	SD	NA
14. A subject search is difficult	SA	AG	N	DA	SD	NA
15. A call number search is easy	SA	AG	N	DA	SD	NA
16. A combined author/title search is difficult	SA	AG	N	DA	SD	NA
DURING A SEARCH:						
17. Remembering commands in the middle of the search is easy	SA	AG	N	DA	SD	NA
18. Finding the correct subject term is difficult	SA	AG	N	DA	SD	NA
19. Scanning through a long display (forward or backward) is easy	SA	AG	N	DA	SD	NA
20. Increasing the result when too little is retrieved is difficult	SA	AG	N	DA	SD	NA
21. Reducing the result when too much is retrieved is easy	SA	AG	N	DA	SD	NA
22. Understanding explanations on the screen is difficult	SA	AG	N	DA	SD	NA
23. Using codes or abbreviations for searching is easy	SA	AG	N	DA	SD	NA
24. Understanding codes or abbreviations on the screen is difficult	SA	AG	N	DA	SD	NA
25. Library names or abbreviations on the screen are easy to understand	SA	AG	N	DA	SD	NA
26. Locating call numbers on the screen is difficult	SA	AG	N	DA	SD	NA
27. Understanding explanations for searching with a short form of a name or a word (truncation) is easy	SA	AG	N	DA	SD	NA
28. Understanding explanations for using logical terms like AND, OR, NOT is difficult	SA	AG	N	DA	SD	NA
29. Remembering the exact sequence or order of commands is easy	SA	AG	N	DA	SD	NA
30. Understanding the initial instructions on the screen is difficult	SA	AG	N	DA	SD	NA
31. Understanding the display for a single book, journal or magazine is easy	SA	AG	N	DA	SD	NA
32. Understanding the display that shows more than a single book, journal or magazine is difficult	SA	AG	N	DA	SD	NA
33. Interrupting or stopping the display of information is easy	SA	AG	N	DA	SD	NA
IN GENERAL:						
34. Typing in exact spelling, initials, spaces and hyphens is difficult to do	SA	AG	N	DA	SD	NA
35. Knowing what is included in the computer catalog is easy to remember	SA	AG	N	DA	SD	NA

DOES NOT APPLY
STRONGLY DISAGREE
DISAGREE
NEITHER AGREE NOR DISAGREE
AGREE
STRONGLY AGREE

IN GENERAL:

36. The years of publication that are included in the computer catalog are difficult to remember	SA	AG	N	DA	SD	NA
37. The order in which items are displayed is easy to understand	SA	AG	N	DA	SD	NA
38. Displayed messages are too long	SA	AG	N	DA	SD	NA
39. Selecting from a list of choices takes too much time	SA	AG	N	DA	SD	NA
40. Entering commands when I want to during the search process is difficult	SA	AG	N	DA	SD	NA
41. Good typing skills are required to use the computer catalog	SA	AG	N	DA	SD	NA

42. Comments:

PART 3: YOUR EXPERIENCE AT THE COMPUTER CATALOG TERMINAL

INSTRUCTIONS: Continue to mark your degree of agreement or disagreement as in the previous section.

DOES NOT APPLY
STRONGLY DISAGREE
DISAGREE
NEITHER AGREE NOR DISAGREE
AGREE
STRONGLY AGREE

43. It is hard to find a free terminal	SA	AG	N	DA	SD	NA

AT THE TERMINAL I USED:

44. The keyboard is confusing to use	SA	AG	N	DA	SD	NA
45. There is too much glare on the screen	SA	AG	N	DA	SD	NA
46. The letters and numbers are easy to read	SA	AG	N	DA	SD	NA
47. The lighting around the terminal is too bright	SA	AG	N	DA	SD	NA
48. The writing space at the terminal is adequate	SA	AG	N	DA	SD	NA
49. Nearby noise is distracting	SA	AG	N	DA	SD	NA
50. The height of the terminal table is about right	SA	AG	N	DA	SD	NA
51. The rate at which the computer responds is too slow	SA	AG	N	DA	SD	NA
52. The availability of signs and brochures is adequate	SA	AG	N	DA	SD	NA
53. Signs and brochures are not very useful	SA	AG	N	DA	SD	NA
54. Library staff are usually available to assist me	SA	AG	N	DA	SD	NA
55. The staff advice is often not helpful	SA	AG	N	DA	SD	NA

IF THERE IS NO PRINTER AT YOUR TERMINAL CONTINUE TO PART 4.

IF THERE IS A PRINTER AT YOUR TERMINAL ANSWER THESE QUESTIONS

	DOES NOT APPLY	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
56. Using the printer is difficult	NA	SD	DA	N	AG	SA
57. The legibility of a copy from the printer is adequate	NA	SD	DA	N	AG	SA
58. The printer noise is distracting	NA	SD	DA	N	AG	SA

PART 4: IMPROVING THE COMPUTER CATALOG

INSTRUCTIONS: Select the response or responses that best reflect your views about changes that should be made in the computer catalog.

59. WHAT ADDITIONAL FEATURES WOULD YOU LIKE THE COMPUTER CATALOG TO HAVE? (Select up to four)

- a. Providing step by step instructions ○
- b. Searching by any word or words in a title ○
- c. Searching by any word or words in a subject heading ○
- d. Limiting search results by date of publication ○
- e. Limiting search results by language ○
- f. Ability to search by journal title abbreviations ○
- g. Ability to change the order in which items are displayed ○
- h. Ability to view a list of words related to my search words ○
- i. Ability to search for illustrations and bibliographies ○
- j. Ability to search words that are next to each other ○
- k. Ability to print search results ○
- l. Ability to search a book's table of contents, summary or index ○
- m. None ○
- n. Other: ○

60. WHICH COMPUTER CATALOG SERVICE IMPROVEMENTS WOULD YOU LIKE THE LIBRARY TO MAKE? (Select up to four)

- a. More terminals ○
- b. Terminals at locations other than near the card catalog ○
- c. Terminals at places other than library buildings ○
- d. A chart of commands posted at the terminal ○
- e. Manual or brochure at the terminal ○
- f. An instruction manual for purchase ○
- g. Training sessions ○

(Continued)

60. (Continued)

- h. More staff assistance with the computer catalog ○
- i. Slide/tape/cassette training program ○
- j. More of the library's books in the computer catalog ○
- k. More kinds of material such as journals, films, maps, etc. in the computer catalog ○
- l. None ○
- m. Other: ○

61. WHAT ADDITIONAL KINDS OF MATERIALS WOULD YOU LIKE TO SEE INCLUDED IN THE COMPUTER CATALOG? (Select up to four)

- a. More dissertations ○
- b. More motion picture films ○
- c. More government publications ○
- d. More journal or magazine titles ○
- e. More maps ○
- f. More manuscripts ○
- g. More music scores ○
- h. More newspapers ○
- i. More phonograph records or tapes ○
- j. More technical reports ○
- k. More of the library's older books ○
- l. None ○
- m. Other: ○

JUST A FEW MORE QUESTIONS—

PLEASE CONTINUE →

PART 5: COMPARING THE CARD CATALOG AND THE COMPUTER CATALOG

INSTRUCTIONS: Compare your experience of the card catalog with your experience of the computer catalog. For each statement indicate whether the CARD CATALOG IS SUPERIOR, the COMPUTER CATALOG IS SUPERIOR or there is NO DIFFERENCE between the two. "Card Catalog" includes book catalogs and microfilm catalogs.

	CARD CATALOG SUPERIOR	THERE IS NO DIFFERENCE	COMPUTER CATALOG SUPERIOR
62. In terms of overall searching speed	( )	( )	( )
63. To search among all or most of the books in the library	( )	( )	( )
64. To search for a specific book, journal or magazine	( )	( )	( )
65. To search for books published in recent years	( )	( )	( )
66. To find a few books on a topic	( )	( )	( )
67. To scan through several book titles	( )	( )	( )
68. To learn to use without assistance	( )	( )	( )
69. To prepare a comprehensive bibliography	( )	( )	( )

PART 6: ABOUT YOURSELF

INSTRUCTIONS: Your responses are confidential. Please do not write your name anywhere on this questionnaire.

70. I USE THIS LIBRARY:
- a. Daily ( )
- b. Weekly ( )
- c. Monthly ( )
- d. About four times a year ( )
- e. About once a year ( )
- f. Not before today ( )

71. I USE THIS COMPUTER CATALOG:
- a. Every library visit ( )
- b. Almost every visit ( )
- c. Occasionally ( )
- d. Rarely ( )
- e. Not before today ( )

72. I USE THIS LIBRARY'S BOOK, CARD OR MICROFILM CATALOG:
- a. Every visit ( )
- b. Almost every visit ( )
- c. Occasionally ( )
- d. Rarely ( )
- e. Not before today ( )

73. THE USE OF COMPUTER TECHNOLOGY LIKE THE COMPUTER CATALOG IS:
- a. Very familiar to me ( )
- b. Somewhat familiar to me ( )
- c. Somewhat unfamiliar to me ( )
- d. Very unfamiliar to me ( )

74. I USE A COMPUTER TERMINAL OTHER THAN THE LIBRARY'S TERMINALS:
- a. Daily ( )
- b. Weekly ( )
- c. Monthly ( )
- d. About four times a year ( )
- e. About once a year ( )
- f. Never ( )

75. I FIRST BECAME AWARE OF THE COMPUTER CATALOG FROM: (Mark all that apply)
- a. Seeing a terminal in the library ( )
- b. Library tour or orientation ( )
- c. An article or written announcement ( )
- d. A course instructor ( )
- e. A friend or family member ( )
- f. Library staff ( )
- g. Other: ( )

76. I LEARNED HOW TO USE THE COMPUTER CATALOG: (Mark all that apply)
- a. By myself ( )
- b. From a friend ( )
- c. Using printed instructions ( )
- d. Using instructions on the terminal screen ( )
- e. From the library staff ( )
- f. From a library course or orientation ( )
- g. From a slide/tape/cassette program ( )
- h. Other: ( )

77. MY AGE GROUP IS:

- a. 14 and under
- b. 15-19 years
- c. 20-24 years
- d. 25-34 years
- e. 35-44 years
- f. 45-54 years
- g. 55-64 years
- h. 65 and over

CONTINUE TO 78

78. MARK YOUR CURRENT GRADE OR HIGHEST GRADE COMPLETED:

Grade School or Elementary School
- a. Up to five
- b. Six
- c. Seven
- d. Eight

High School or Secondary School
- e. Nine
- f. Ten
- g. Eleven
- h. Twelve

College or University
- i. Thirteen
- j. Fourteen
- k. Fifteen
- l. Sixteen
- m. Over sixteen

IF YOU ARE COMPLETING THIS QUESTIONNAIRE AT A COLLEGE OR UNIVERSITY ANSWER THE NEXT 3 QUESTIONS.

IF YOU ARE COMPLETING THIS QUESTIONNAIRE AT A PUBLIC LIBRARY STOP HERE AND RETURN THE QUESTIONNAIRE. THANK YOU FOR PARTICIPATING IN THIS STUDY OF THE COMPUTER CATALOG.

79. THE CATEGORY THAT BEST DESCRIBES MY ACADEMIC AREA IS:

- a. Arts and Humanities
- b. Natural Sciences
- c. Social Sciences
- d. Agriculture
- e. Business/Management
- f. Education
- g. Engineering
- h. Medical/Health Sciences
- i. Law
- j. Major not declared
- k. Interdisciplinary

80. THE MAIN FOCUS OF MY ACADEMIC WORK AT THE PRESENT TIME IS:

- a. Course Work
- b. Teaching
- c. Research
- d. Both Teaching and Research
- e. Teaching and Course Work
- f. Research and Course Work

81. MY PRESENT AFFILIATION WITH THIS COLLEGE OR UNIVERSITY IS:

- a. Undergraduate
- b. Graduate - master's level
- c. Graduate - doctoral level
- d. Faculty
- e. Nonfaculty Research Staff
- f. Nonfaculty Teaching Staff
- g. College or University Staff
- h. Other status
- i. Alumnus or Alumna
- j. No affiliation

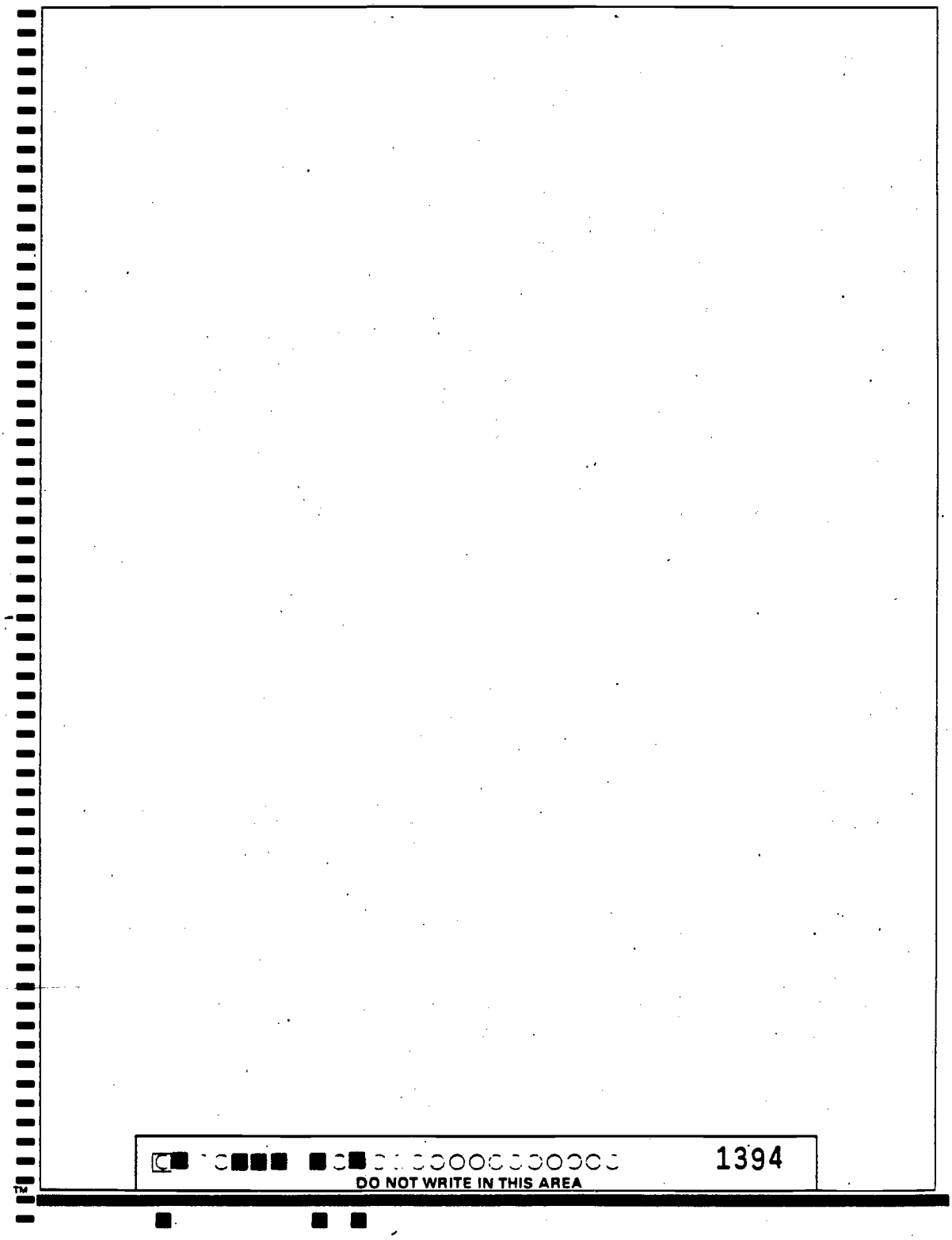
THIS COMPLETES THE QUESTIONNAIRE. PLEASE RETURN IT.

THANK YOU FOR PARTICIPATING IN THIS STUDY OF THE COMPUTER CATALOG.

SUPPLEMENTARY QUESTIONNAIRE ITEMS

82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116

Report Number: OCLC/OPR/RR-83/4
1983 March 31



APPENDIX D. PRETEST NONUSER QUESTIONNAIRE

COUNCIL ON LIBRARY RESOURCES

COMPUTER CATALOG STUDY

QUESTIONNAIRE

OFFICE USE ONLY

LIBRARY SYSTEM | LOCATION | DATA COLLECTOR | DATE: MO. DAY YR.

VERIFIED: ☐

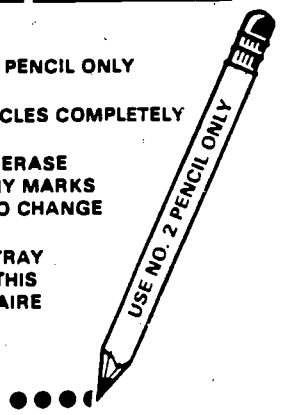
BY: _____

DATE: _____

THE LIBRARY HAS A COMPUTER CATALOG AND NOT EVERYONE HAS HAD A CHANCE TO USE IT YET. IF YOU HAVE NEVER USED THE COMPUTER CATALOG YOU CAN CONTRIBUTE TO THE QUALITY OF LIBRARY SERVICES BY COMPLETING THIS QUESTIONNAIRE. IT TAKES ABOUT FIVE MINUTES. YOUR RESPONSES ARE CONFIDENTIAL. PLEASE DO NOT WRITE YOUR NAME ANYWHERE ON THE QUESTIONNAIRE. THANK YOU.

MARKING INSTRUCTIONS

- USE A NO. 2 PENCIL ONLY
- FILL THE CIRCLES COMPLETELY
- BE SURE TO ERASE CLEANLY ANY MARKS YOU WISH TO CHANGE
- MAKE NO STRAY MARKS ON THIS QUESTIONNAIRE



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DO NOT WRITE IN THIS AREA

NCS Trans-Optic 08-15108.321

PART 1: WHAT YOU THINK ABOUT THE COMPUTER CATALOG

INSTRUCTIONS: Please mark the response that best describes how you view a computer catalog.

1. I HAVE NOT USED THE COMPUTER CATALOG UP TO NOW BECAUSE:
(Mark all that apply)
   a. I do not like to use computers ..... ○
   b. I did not know there was a computer catalog ... ○
   c. I do not know where it is ..... ○
   d. I have not had time to learn how to use it ..... ○
   e. I do not know if there are training sessions on how to use it ..... ○
   f. There has not been any staff at the terminals to assist me in using it ..... ○
   g. The terminals were all in use when I wanted to use it ..... ○
   h. I have not needed to use any library catalog recently ..... ○
   i. The card catalog is easier to use ..... ○
   j. The card catalog contains more of the information I need ..... ○
   k. Other: ..... ○

MARK ONE ONLY IN QUESTIONS 2-5

2. HOW MUCH TIME DO YOU THINK IT TAKES TO LEARN TO USE THE COMPUTER CATALOG?
   a. 15 minutes or less ..... ○
   b. Between 15 minutes and 30 minutes ..... ○
   c. Between 30 minutes and an hour ..... ○
   d. Between an hour and ½ of a day ..... ○
   e. Between ½ of a day and a day ..... ○
   f. A day or more ..... ○

3. HOW DIFFICULT OR EASY DO YOU THINK IT WOULD BE TO LEARN TO USE THE COMPUTER CATALOG?
   a. Very difficult ..... ○
   b. Somewhat difficult ..... ○
   c. Somewhat easy ..... ○
   d. Very easy ..... ○

4. MY OVERALL OR GENERAL ATTITUDE TOWARD THE COMPUTER CATALOG IS:
   a. Very favorable ..... ○
   b. Somewhat favorable ..... ○
   c. Somewhat unfavorable ..... ○
   d. Very unfavorable ..... ○

5. HOW LIKELY ARE YOU TO USE THE COMPUTER CATALOG IN THE FUTURE?
   a. Very likely ..... ○
   b. Somewhat likely ..... ○
   c. Somewhat unlikely ..... ○
   d. Very unlikely ..... ○

PART 2: COMPARING THE CARD CATALOG AND THE COMPUTER CATALOG

INSTRUCTIONS: Compare your experience of the card catalog with what you expect or think a computer catalog does. For each statement indicate whether the CARD CATALOG IS PROBABLY SUPERIOR, the COMPUTER CATALOG IS PROBABLY SUPERIOR or there is PROBABLY NO DIFFERENCE between the two. "Card Catalog" includes book catalogs and microfilm catalogs.

	COMPUTER CATALOG PROBABLY SUPERIOR	PROBABLY IS NO DIFFERENCE	CARD CATALOG PROBABLY SUPERIOR
6. In terms of overall searching speed	○	○	○
7. To search among all or most of the books in the library	○	○	○
8. To search for a specific book, journal or magazine	○	○	○
9. To search for books published in recent years	○	○	○
10. To find a few books on a topic	○	○	○
11. To scan through several book titles	○	○	○
12. To learn to use without assistance	○	○	○
13. To prepare a comprehensive bibliography	○	○	○

PART 3: ABOUT YOURSELF

INSTRUCTIONS: Your responses are confidential. Please do not write your name anywhere on this questionnaire.

14. I USE THIS LIBRARY:

a. Daily ..... ○
b. Weekly ..... ○
c. Monthly ..... ○
d. About four times a year ..... ○
e. About once a year ..... ○
f. Not before today ..... ○

15. I USE THIS LIBRARY'S BOOK, CARD OR MICROFILM CATALOG:

a. Every visit ..... ○
b. Almost every visit ..... ○
c. Occasionally ..... ○
d. Rarely ..... ○
e. Not before today ..... ○

16. THE USE OF COMPUTER TECHNOLOGY LIKE THE COMPUTER CATALOG IS:

a. Very familiar to me ..... ○
b. Somewhat familiar to me ..... ○
c. Somewhat unfamiliar to me ..... ○
d. Very unfamiliar to me ..... ○

17. I USE A COMPUTER TERMINAL OTHER THAN THE LIBRARY'S TERMINALS:

a. Daily ..... ○
b. Weekly ..... ○
c. Monthly ..... ○
d. About four times a year ..... ○
e. About once a year ..... ○
f. Never ..... ○

18. MY AGE GROUP IS:

a. 14 and under ..... ○
b. 15-19 years ..... ○
c. 20-24 years ..... ○
d. 25-34 years ..... ○
e. 35-44 years ..... ○
f. 45-54 years ..... ○
g. 55-64 years ..... ○
h. 65 and over ..... ○

19. MARK YOUR CURRENT GRADE OR HIGHEST GRADE COMPLETED:

Grade School or Elementary School
a. Up to five ..... ○
b. Six ..... ○
c. Seven ..... ○
d. Eight ..... ○

High School or Secondary School
e. Nine ..... ○
f. Ten ..... ○
g. Eleven ..... ○
h. Twelve ..... ○

College or University
i. Thirteen ..... ○
j. Fourteen ..... ○
k. Fifteen ..... ○
l. Sixteen ..... ○
m. Over sixteen ..... ○

IF YOU ARE COMPLETING THIS QUESTIONNAIRE AT A COLLEGE OR UNIVERSITY ANSWER THE NEXT QUESTIONS.

IF YOU ARE COMPLETING THIS QUESTIONNAIRE AT A PUBLIC LIBRARY STOP HERE AND RETURN THE QUESTIONNAIRE. THANK YOU FOR PARTICIPATING IN THIS STUDY OF THE COMPUTER CATALOG.

20. THE CATEGORY THAT BEST DESCRIBES MY ACADEMIC AREA IS:

a. Arts and Humanities ..... ○
b. Natural Sciences ..... ○
c. Social Sciences ..... ○
d. Agriculture ..... ○
e. Business/Management ..... ○
f. Education ..... ○
g. Engineering ..... ○
h. Medical/Health Sciences ..... ○
i. Law ..... ○
j. Major not declared ..... ○
k. Interdisciplinary ..... ○

PLEASE CONTINUE ON THE BACK PAGE

21. THE MAIN FOCUS OF MY ACADEMIC WORK AT THE PRESENT TIME IS:
   a. Course Work
   b. Teaching
   c. Research
   d. Both Teaching and Research
   e. Teaching and Course Work
   f. Research and Course Work

22. MY PRESENT AFFILIATION WITH THIS COLLEGE OR UNIVERSITY IS:
   a. Undergraduate
   b. Graduate - master's level
   c. Graduate - doctoral level
   d. Faculty
   e. Nonfaculty Research Staff
   f. Nonfaculty Teaching Staff
   g. College or University Staff
   h. Other status
   i. Alumnus or Alumna
   j. No affiliation

THIS COMPLETES THE QUESTIONNAIRE. PLEASE RETURN IT. THANK YOU FOR PARTICIPATING IN THIS STUDY OF THE COMPUTER CATALOG.

2939

DO NOT WRITE IN THIS AREA