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ABSTRACT

Five of the seven papers in this collection focus on the use of technology for information retrieval and resource sharing: (1) "Teaching Students How To Search Bibliographic Retrieval Systems: The Unit Record Approach" (George Bell); (2) "The Online Catalog and Bibliographic Databases as Shared Resources: The Impact and Issues of Networking a Library's Online System" (Dennis Brunning and George Machovec); (3) "The Development and Use of Online Indexes" (Arlys MacDonald); (4) "Collection Development and Compact Discs: Establishing Criteria" (Jeanne Pfander); and (5) "Union Lists of Serials--An Old Idea with a New Application in Modern Resource Sharing" (Terese Varga). The two remaining papers are "'Information Power' and the School Librarian: An Educational Resource" (Joanna Jones) and "Librarianship in El Salvador" (Sheila Milam). A copy of the questionnaire for the school librarian survey is included. (BBM)

ARIZONA STATE LIBRARY ASSOCIATION

College and University Libraries Division

DECISION 2000

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INSTRUCTION IN BIBLIOGRAPHIC RETRIEVAL SYSTEMS USING THE UNIT RECORD APPROACH

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A conceptual approach to the teaching of database searching by use of the unit record is discussed. Theoretical learning models and applied library instruction theory are also considered. Using ABI/INFORM on CD-ROM as the model database, suggestions are given on how this method could be applied in a classroom setting. By using this approach, students will have a better understanding of information retrieval systems when they are in need of searching other databases situated on other systems.

INTRODUCTION

As our libraries become more complex and the storage of information becomes more sophisticated, our ability to convey these ideas to our users becomes more critical. Likewise, our knowledge of learning theories will become more critical to our performance in the classroom. We, as teachers, need to respond to the ever changing demands of library instruction by employing the concept approach, wherever applicable, to the retrieval of information. This paper presents a specific type of instructional approach for students that is based on the "building blocks" of information retrieval systems; specifically the understanding of the unit record and its components. Hopefully, by employing this concept, the students will not only gain insight into the retrieval process, but the amount of time we have with a class will be used to its fullest. In addition, the end-user will be able to make more informed decisions when formulating search strategies on their own.

THE SETTING

Many college and university libraries today are faced with a number of different end-user electronic retrieval systems. Among them are online catalogs, CD-ROM databases, and the fifty or so databases that can be accessed via systems such as BRS/AFTER DARK and *Knowledge Index*. Some online catalogs hold many other databases besides the traditional "card catalog" database. In fact there are a number of online catalogs that contain in-house databases, Wilson Indexes, and the like. These online catalogs have become, in essence, miniature libraries on their own. Paper equivalents of many of these indexes have been cancelled and/or never existed. The electronic formats have been substituted in their place. Therefore, patrons arriving at these libraries are faced with the major indexes in either CD-ROM, online catalog, or online database formats. Between these different types of electronic tools, users could conceivably find most or all of the information they need.

The students, however, are also faced with the prospect of having to learn how to search these systems. Without a paper copy backup there is no alternative. In addition, because software programs differ between the online catalog, the CD-ROM's, Knowledge Index, and BRS/AFTER DARK and because there are differences in software between the CD-ROM's and the online search systems, it is critical that a patron have knowledge of

these programs in order to employ these databases. Therefore it is a must that these various electronic tools be taught in the library's instructional programs.

Many academic librarians are currently instructing their students in the use of this technology by offering course-integrated presentations and specialized workshops. This type of tutoring necessitates many hours of instruction. Unlike instruction in the use of many of the paper indexes, more novel approaches are called for in the teaching of information retrieval systems. As mentioned previously, these new approaches are necessary because of the large number of databases, different software programs, numerous and varied fields within a record and the manipulation of these fields. By understanding the anatomy of a unit record contained within any of these retrieval systems, a user will have a conceptual understanding of and an ability to create search strategies within any of these systems.

In order to develop a conceptual instructional approach to information retrieval systems it is necessary to outline major theories of learning as well as discuss how these conceptual ideas have already been applied to bibliographic instruction.

THEORIES OF LEARNING

By completely understanding a concept, one can achieve a higher success rate of problem solving for new situations that are covered by the concept. For example, a student's understanding of Mendel's Laws of Segregation and Independent Assortment are mandatory in order to solve a variety of different problems in classical genetics. By explaining the rules of combining genes using letters via the "tic tac toe" method one could arrive at the correct answer. However, the ability to solve these problems when encountering a differently worded exercise will be difficult if Mendel's Laws are not fully understood. Rules such as the use of "in de" after a descriptor when using ERIC via Silver Platter can be taught. However, does the learner understand what is occuring at the system level in employing "in de" and can that knowledge be applied to another CD-ROM running off of different software?

In support of the above statement Chi and Rees state in their article "A Learning Framework for Development" (1) that

> *once a new structure is formed, it allows a new level of understanding into many related problems. This happens both because the new structure itself has some generality built in and because a given structure can spawn many new related ones through various processes, which might be summed up as learning by analogy.*

It is not only important for a student to be able to use a particular CD-ROM system but to understand the conceptual ideas behind it in order to know what questions to ask when confronted with another system. Some typical examples might be, does the system have the capability of access by fields?, can proximity searching be performed? and what designation is needed in order to access a field by a journal name? Chi and Rees (2) suggest that

> *when one attains some new level of competence, it is because a new knowledge structure has been formed, perhaps by combining old ones, perhaps by creating an analog of an old one, perhaps some other way.*

They go on to quote Rozin (3) by stating that

> *cognitive development is the increasing ability to access or apply a skill to a wider domain of tasks and situations.*

A new knowledge structure is created when a unit record and its component parts are understood. This in turn will enable the searcher to apply that knowledge to other bibliographic retrieval systems. It should apply to CD-ROM, online catalogs, online services and any other type of electronic retrieval format.

In citing William Perry's four stages of intellectual and ethical development, Coleman (4) considers how these stages may apply to library instruction. The four stages are Dualism, Multiplicity, Relativism and Commitment. In Dualism, answers to questions have to be right or wrong. Multiplicity indicates less certainty between right and wrong. Relativism and Commitment depicts advanced stages where students begin to realize that few things can be absolute and that decisions will need to be made while understanding that nothing can be certain. In instructing a class through the unit record approach the students will need to develop from the Dualism stage into the Multiplicity stage at a minimum.

A future researcher needs to understand that there can be a number of search strategies and that these strategies can all be valid to some degree or another. For example, a user researching the control of aphids in the garden could create a strategy based on its face value, that is, controlling aphids in the garden. However one could approach this problem by looking deeper into its content, such as the control or eradication of aphids on plants. In either case strategies could be run by restricting the concepts to the descriptors or using natural language restricted to the title or not restricting the natural language or any combination one may wish to consider. Depending on the sophistication of the patron, the scientific name or genus name of aphids may be applied. By understanding the concept of the unit record, the pupil will be able to construct alternative strategies of his/her own. They will understand the "nuts and bolts" of the system and will know what to look for in other similar systems. They will have a better understanding of why alternative strategies are both useable and acceptable. In addition, the Dualist stage will merge into the Multiplicity stage by the very nature of the instruction.

APPLIED LEARNING THEORY IN LIBRARY INSTRUCTION

A number of papers and books written in recent years have specifically considered the idea of a concept approach to library instruction. Papers by Bechtel (5), Bodi (6), and Huston (7), to name a few, as well as Conceptual Frameworks for Bibliographic Education, edited by Reichel and Ramey, (8) all strongly support this idea. Huston, (9) in citing Borgman's paper, suggests that recent research has determined that users can never exploit an information retrieval system fully unless the conceptual aspects are fully understood. She goes on to say that the early end-user instruction programs emphasized skills, not concepts. Bodi (11) considers that

> *BI within the college curriculum is an appropriate teaching strategy to encourage and reinforce the development of critical thinking,*

while Bechtel (12), in considering Baker's paper, emphasizes instruction to include the principles of database management systems, record file structures, and other building blocks for information retrieval systems.

In Conceptual Frameworks for Bibliographic Education : theory into practice, Joan Lippincott (12) in her chapter on end-user instruction states the following:

> *In developing sophisticated search techniques, understanding the structure of the bibliographic record is critical. Limiting a search to a particular field is one method of heightening the precision of a search. Using the logical operators 'with' and 'same' is also dependent on an understanding of fields.*

I am in total agreement with this statement. Although the concept of a unit record seems simple enough, it's not until specific Boolean operators are being used that the knowledge of the concept is tested. Furthermore, it is in using the operators to manipulate fields that the understanding, or lack of it, becomes evident.

CONCEPTUAL APPROACH TO INFORMATION RETRIEVAL INSTRUCTION

As noted earlier, an understanding of the unit record and its component parts within a retrieval system is vital for the patron to establish the conceptual idea of retrieval. By exploiting this knowledge a researcher can move from one retrieval system to another with a certain degree of confidence. The user will know what to consider. They will know the types of questions to ask. This section of the paper is devoted to the classroom procedure of introducing the student to the concept. For sake of expediency these applications will be devoted to retrieval on a CD-ROM system, specifically ABI/INFORM. They can, however, be applied to retrieval systems located on other CD-ROMs, databases located in an online system, online catalogs, and the like.

In the opening remarks of a classroom or seminar session, the scope of the database should be explained. The subjects, years covered, number of journals indexed, etc., are elements which should all be included. Mention can be made of how the retrieved information can be useful in writing term papers, projects, etc. The classroom participants are then presented with a copy of the unit record. An example of an ABI/INFORM unit record is shown in Figure 1, Appendix A. There are tens of thousands of these records on a CD-ROM. Their task is to locate only those records that are relevant to their needs. The proverbially "finding a needle in the haystack" can be mentioned. In the case of ABI/INFORM, the title, author, journal, company, terms, codes and abstract fields are discussed. This discussion should not only verify the existence of the fields. The creation of the fields should also be examined.

These fields are created by the author, by the publisher, and also by the indexers, who are employed by the company producing this product. Indexers create certain fields based on controlled vocabulary, controlled codes, etc., and that these and the other fields can be searched exclusive or in concert with the others. The scope of the controlled vocabulary field, code field, and company field should also be considered. In short, by having a thorough knowledge of the input, a better understanding of the output (retrieved records) will be forthcoming. It may be useful at this point for the students to see how an indexer might approach applying codes and terms, etc. to a typical journal article. The importance of creating these fields will become apparent in considering the following example.

"The Amazing Worlds of Doctor Kapoor", appearing in the journal Perspective, (13) is not an article about Mr. Wizard and his exploits. The indexer, by examining the entire article determined that it is dealing with management styles in the pharmaceutical industry, specifically the company, LyphoMed. If a search was needed dealing with management

styles in the pharmaceutical industry, the article would be lost without the creation of a term and code field. It would also be lost if the company and abstract field was absent. In truth, the term **management style** is not even mentioned in the abstract.

A common mistake made by students when accessing a CD-ROM is to enter terms without qualifying them; that is, not restricting them to certain fields of the record. Unfortunately, in most cases, the patron is not aware of how the computer is interpreting their statement. It is at this point that the class be introduced to what actually occurs when unqualified words are being entered. They are asked to consider how a computer will interpret these free text words.

By having a copy of the ABI/INFORM unit record in front of them and/or projected on an overhead, it can be shown that without qualifiers the computer will search every field that comprises the unit record. The user is then given an example of what will be retrieved by this method. When using ABI/INFORM, entering the word **management**, will not only pull records that have **management** as an index term, but will also pull every record in which **management** appears in any of the fields. Therefore, every journal, every title, every abstract, etc. containing the word **management** will be retrieved. The computer has not been instructed as to what field should be searched so it will default to all searchable fields. In most cases this will create poor retrieval and a slower response time.

It is also useful in this discussion to mention situations when a word should be entered in a free text mode (not limited to a field). For example, information on Maquiladoras (US-owned manufacturing plants along the northern border of Mexico) should be retrieved by entering **Maquiladoras** as a free text term. However, the researcher should once again be aware of how the computer is interpreting the input. Terms that cannot be translated into the controlled vocabulary fields, code fields, company fields, etc., are good candidates for free text searching, as in the case of Maquiladoras. An example of an ABI/INFORM unit record dealing with Maquiladoras is shown in Figure 2, Appendix B. Note that **Maquiladoras** is not present in the term or code field. It is usually at this point in the discussion that a "light" goes on for many of the classroom participants who had worked with ABI/INFORM previously but had no idea of field searching. They begin to realize why their retrievals were not on "target".

Another consideration to impress upon the class is that the unit record/field idea can be applied to any CD-ROM or for that matter any database on any retrieval system. Spend some time in this discussion. You may wish to distribute a copy of a unit record from a retrieval system other than ABI/INFORM. Have students examine it and identify the fields that compose it. The researchers should be able to point out differences between the two unit records regarding the composition of the fields. For example, in comparing an ERIC unit record to that of an ABI/INFORM record, you will not see a codes field or a company field. However, in most cases, you will see a major descriptor field, an identifier field, etc. The students will see that although some of the fields are different, the basic premise is the same; that is, these fields are searchable. This idea is essential. Relating the field concept from one system to another will enhance what you are attempting to accomplish. It will give the searcher additional information to become more self-reliant.

Once one feels comfortable with the unit record approach, the process of manipulation of the fields can be introduced. With that, the procedure of how fields are identified for input into the computer can also be discussed. In the case of ABI/INFORM, students can be introduced to pages in the ABI/INFORM ONDISC USER'S GUIDE (14) that contain a list of all searchable fields and how those fields should be entered into the system. The term 'te' or most recently 'de' is applied in order to alert the computer that only the terms field is to be searched. As an example have students refer to the ABI/INFORM thesaurus,

or a sample page from the thesaurus. These words in the thesaurus are the acceptable words or phrases to be entered in the terms field. Therefore if one wished to search for articles dealing with income taxes and income taxes is an acceptable thesaural term, which it is, then the researcher would enter into the system, **te(income taxes)**. The computer will then pull all unit records that have income taxes as an index term.

If you wish to find all articles relating to the pharmaceutical industry you can use the code field. ABI supplies you with a list of codes that identify, among other things, major industries. The code for the pharmaceutical industry is 8641. You would enter it as **cd(8641)**. The cc designation for the codes field is also acceptable at this time. The computer will then pull all unit records having the code 8641 applied in the code field. By combining these two ideas, **te(income taxes)** and **cd(8641)** the computer will then pull only those unit records that have income taxes in the terms field and 8641 in the code field. Therefore the records pulled should have something to do with income taxes in the pharmaceutical industry. See Figure 3 for a sample list of thesaural terms and Figure 4 for a sample list of codes.

It is at this point that search questions can be introduced. The searches should be broken up into their various concepts and the concepts be translated into the language of the fields as best as possible. The Boolean operators should also be introduced at this time. It is best to begin at an elementary level in which practice search statements are such that only codes or controlled vocabulary are needed, as in the above example. Search questions can then be developed to allow for other fields to be used. A search for articles dealing with Volvo from 1987 to the present would be a useful example. This type of search would incorporate the company and the date fields. It would be entered as co(Volvo) and da(1987 or 1988 or 1989 or 1990). Companies can also be searched in the Dun's business number field 'du' and in the terms field 'te'. The major point to make is that any combination of fields, using Boolean logic, may be employed depending on the search request. As was mentioned previously, there are times when a particular concept is simply not translatable into fields such as the Maquiladoras search. This idea of free text searching, as a concept, along with concepts that could be satisfied by fields, should also be incorporated into a sample search question. Various forms of proximity searching and its accompanying commands can be introduced near the end of the session, using the same technique as mentioned previously. A specific type of proximity searching, such as one or two words next to each other, could also be introduced when describing the author field.

By introducing the searcher to this instructional approach, not only will they gain skill in searching ABI/INFORM, but they will also obtain insights into the workings of other retrieval systems. The students should be aware that in examining a unit record of another CD-ROM, such as Psychlit, the blueprint of the system is revealed. What to ask for or look up in the manual when it comes to entering terms associated with a particular field will become more apparent. This same argument will hold true when one wishes to search for information on a database that is connected with an online search service. Likewise, as in the case of many online catalog systems, where field searching is not applicable, the student will have an appreciation of what occurs when a term or terms are entered into the system; i.e., the entire record, for the most part, will be searched.

By using this approach the user will begin to understand that in many cases there is no one right answer in formulating search strategies. Many search strategies could be formulated giving different but relevant results. The students will have moved from the Dualist stage to the Multiplicity stage and hopefully, to the Relativism and Commitment stages of intellectual development as suggested by William Perry. It is with this method of instruction, I believe, that students will not only gain a deeper understanding of information

retrieval systems, but will also give them a "foundation of thinking" in order to pursue other intellectual endeavors both in and outside the classroom.

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APPENDIX A

Figure 1
ABI/INFORM Unit Record

89-12776

Title:	Assuring Customer Satisfaction: Management/Labor Partnership
Authors:	Stempel, Robert C.; Ephlin, Donald P.
Journal:	Quality Progress Vol: 22 Iss: 2 Date: Feb 1989 pp: 45-47 Jrnl Code: QPR ISSN: 0033-524x
Company:	General Motors Corp (DUNS: 00-535-6613)
Terms:	Customers; Satisfaction: Automobile industry; Case studies; Quality control; Unions
Codes:	8680 (Transportation equipment industry); 9110 (Company specific); 5320 (Quality control); 6300 (Labor relations)
Abstract:	General Motors Corp. (GM) feels that the best means of quality improvement is through the effective use of people. The increase in foreign competition in the automobile industry made both union leaders and corporate managers at GM realize that changes had to be made. Unions and management have now joined together in a quality network, which is the people involvement process. Teamwork and continuous quality improvement are emphasized, and the network itself is based on a commitment to let the voice of the consumer drive everything that GM does: engineering, design, marketing, manufacturing, sales, and service. High-technology plants have been built that demand skills from workers. GM has spent $650 million since 1984 to upgrade the skills of its employees. Customer satisfaction is the objective that drives the corporate strategy. Every person at GM, whether union or management, has a part in the success of the business. Quality and people have always been interrelated, but GM is only now realizing how vital the relationship is and how it works. The organization is at the start of a process that will make it much easier to bring quality people and quality products together. Tables.

APPENDIX B

Figure 2
ABI/INFORM Unit Record (Maquiladoras)

89-24593

Title: Maquiladoras: Mexico's Tiger by the Tail?
Authors: Mirowski, Philip; Helper, Susan
Journal: Challenge Vol: 32 Iss: 3 Date: May/Jun 1989 pp: 24-30
Jrnl Code: CHL ISSN: 0577-5132
Terms: Mexico; Manufacturing; Foreign subsidiaries; Value added; Statistical data; National debt; Multinational corporations; Tariffs; Trade restrictions; Foreign exchange rates; Business growth
Codes: 9180 (International); 1300 (International trade & foreign investment); 1110 (Economic conditions & forecasts); 8600 (Manufacturing industries); 9140 (Statistical data)
Abstract: The original maquiladora program in Mexico was a legal arrangement designed to encourage US firms to ship components to Mexico, hire cheap Mexican labor for assembly, and ship finished products back to the US for sale. However, modern maquilas have begun raising old and contentious issues about the desirability of enclave development strategies and are bringing into play the debt crisis of Latin America and the deindustrialization of the US. The inadvertent combination of maquilas and Mexican debt has the potential to profoundly alter trade policy, industrial structure, environmental conditions, tax policy, and the quality of work life in both the US and Mexico. Although some improvement in the maquila plant system may occur, changed attitudes among US firms are the exception rather than the rule. Historians may record that maquiladoras made Mexico culturally more like the US, but, by pulling firms out of the US, they also made the US. economically more like Mexico. Tables.

APPENDIX C

Figure 3
ABI/INFORM THESAURAL TERMS

Income redistribution
rt Redistribution
Income shifting
sn Used from 1986 forward
rt Clifford trusts
rt Spousal remainder trusts
Income statements
uf Earnings statements
rt Financial statements
Income Tax Act-Canada
Income tax returns
rt Tax preparation
rt Tax returns
Income taxes
rt Corporate income tax
rt Direct taxes
rt Estimated taxes
rt Minimum income taxes
rt Negative income tax
rt Ordinary income
rt Taxes
Incomes policy
u **Wage & price controls**
Incompetent
Incorporation
rt Going public
Increases
rt Appreciation
rt Raises
Incremental
Incremental costs
u **Marginal costs**
Increments
Indemnity
rt Double indemnity (INS)
Independence
rt Accountant independence
Dependence
rt Interdependence
Independent
Independent accountant appointments
rt Client relationships
rt Engagement letters
Index linking
u **Indexation**
Index measurement (ACC)
rt Cost analysis
Indexation
uf Index linking
rt Economic indicators
rt Indexing
rt Price indexes
Indexes
rt Price indexes
Indexing
Indexation
Indians (American)
u **Native Americans-US**
Indicators
u **Business indicators**
u **Economic indicators**
u **Social indicators**
Indifference
rt Attitudes
Indigenous
Indirect
indirect charges
u **Overhead costs (ACC)**
Indirect damage (INS)
rt Damages
Indirect labor costs
rt Labor costs
Indispensable financing (ACC)
rt Contingencies
Individual
Individual retirement accounts
uf IRAs
rt ERISA
rt Pension plans
Indoor
Induced
Inductive
rt Deducive
Industrial
Industrial accidents
rt Accidents
rt Industrial safety
rt Occupational hazards
Industrial advertising
sn Used from 1985 forward
uf Business to business advertising
Industrial concentration
rt Concentration
rt Economic structure
rt Monopolies
rt Monopsony
rt Oligopsony
Industrial democracy
uf Participatory democracy
rt Participatory management
rt Worker codetermination
Industrial development
uf Industrialization
rt Economic development
rt Industrial parks
rt Industrial policy
rt NICs
Industrial development bonds
uf Industrial revenue bonds
rt Bonds
Industrial distributors
u **Distributors**
Industrial economics
rt Economics
Industrial engineering
rt Engineering
rt Work study
Industrial equipment
rt Cranes & hoists
rt Equipment
rt Pumps
Industrial Espionage
rt Espionage
rt Trade secrets
Industrial estates
u **Industrial parks**
Industrial gases
rt Gas
Industrial goods
rt Capital goods
rt Consumer goods
Industrial hygiene
rt Hygiene
rt Industrial safety
rt Occupational safety
Industrial integration
rt Size of enterprise
Industrial markets
rt Markets
Industrial parks
uf industrial estates
rt industrial development
rt Site selection
Industrial policy
sn Used from 1985 forward
cc 1120
rt Economic policy
rt Industrial development
Industrial relations
u **Labor relations**
Industrial research
rt Research
Industrial revenue bonds
u **Industrial development bonds**
Industrial safety
rt Industrial accidents
rt Industrial hygiene
rt Occupational safety
rt Safety
Industrial trucks
rt Forklift trucks
rt Trucks
Industrial trucks
rt Forklift trucks
rt Trucks
Industrial wastes
rt Pollutants
rt Pollution control
rt Waste disp
rt Wastes
Industrialization
u **Industrial development**
Industrialized nations
rt LDCs
rt NICs
Industries
rt Many industries
Industry

APPENDIX D

Figure 4
ABI/INFORM CODES

Hardware	5230
Health care industry	8320
Health insurance industry	8210
Hotel/hospitality industry	8380
Human resource management	6000
Human resource planning	6100
Income taxes-corporate	4210
Income taxes-personal	4230
Information management	5200
Information systems	5240
Insurance industry	8200
International focus	9180
International trade	1300
Inventory management	5330
Investment analysis	3400
Investment services	8130
Labor relations	6300
Law	4300
Legislation	4320
Liability insurance	8220
Life insurance industry	8210
Liquor industry	8610
Litigation	4330
Lumber & wood products industries	8630
Machinery industry	8670
Maintenance management	5130
Management personnel	2100
Management science	2600
Management-general	2000
Managerial skills	2200
Manufacturing industries not elsewhere classified	8600
Market research	7100
Marketing	7000
Medical insurance	8210
Mergers	2330
Metals & metalworking industries	8660
Mining industry	8500
Minority-owned business	9521
Multinational corporations	9510
Natural resources	1530
New product planning	7500
Non-US articles	9170
Nonprofit institutions	9540
Office automation	5210
Office management	5110
Operations	5000
Operations research	2600
Organizational behavior	2500
Organizational structure	2320
Paper industry	8630
Pension fund management	3600
Personal profiles	9160
Personnel management	6100
Petroleum industry	8510
Pharmaceuticals industry	8641

THE ONLINE CATALOG AND BIBLIOGRAPHIC DATABASES AS A SHARED RESOURCE: THE IMPACT AND ISSUES OF NETWORKING A LIBRARY'S ONLINE SYSTEM

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INTRODUCTION

Traditionally, resource sharing among libraries has involved cooperative efforts to locate, acquire and physically share materials. This resource sharing included such activities as interlibrary loan, cooperative collection development plans and reference referral services. If, for example, a patron could not find a book or journal, they would be sent to interlibrary loan so that a request could be made to another library. This ILL process would often take several weeks and may involve using some bibliographic network which may or may not be computerized.

Advances in computer technology and telecommunications have allowed libraries to significantly alter the manner in which resource sharing may be accomplished. Through local integrated systems, libraries are now beginning to locally load a wide variety of databases of both a bibliographic and non-bibliographic nature and computer networking has opened up a host of opportunities for interfacing library online catalogs and gatewaying to databases around the world. More than ever, the patron is directly and significantly involved in this new resource sharing process.

These electronic advances in resource sharing raise new technical, organizational and service issues in academic libraries. Ever closer to the goal of bringing the patron and document together, these advances will also bring new and higher costs along with greater library use and user expectations.

Some of the issues to be briefly explored will include the local loading of databases, gatewaying and networking online systems, the Internet, collection management issues, information tasks of reference and the instructional challenge of invisible users. Throughout, emphasis will be on the real and perceived impacts at Arizona State University (ASU) Libraries which for the last several years has been extensively involved in locally loading and networking with the online catalog.

LOCALLY LOADING DATABASES

Due to the greater availability of minicomputers and mainframe computers a growing number of large libraries are considering the local loading of databases either from proprietary database producers (e.g. H.W. Wilson, Information Access Company, ISI, ERIC,) or through locally developed efforts. In some cases these databases are loaded as part of the online catalog (as with NOTIS and CARL libraries) and in other cases databases are loaded on a separate institutional mainframe using an appropriate text retrieval package (popular choices seem to be BRS/On-Site and Battelle's BASIS).

The advantage of a locally loaded database on a larger system is that multiple users from many workstations can use the files at one time. Also, since the same search software will be used for each database, the patron will not need to learn different search protocols when switching files. Many database producers are realizing this new trend in the industry and are coming out with reasonably priced magnetic tape leasing fees which do not have connect time and hit charges (those that do not will never break into this new market).

The major difficulty of this solution is that an organization will need to be large enough to have an integrated library system which will support this solution or be able to have access to some computer system which is able to load the desired search software and can support the amount of Winchester disk storage required. Some libraries which are actively working in this area include Georgia Institute of Technology, Carnegie Mellon University, Vanderbilt University, Arizona State University, Lehigh University, California Institute of Technology, the University of Southern California, the Colorado Alliance of Research Libraries, University of Michigan, University of Hawaii and others.

At Arizona State University Libraries, over 20 databases have been loaded on the libraries Tandem computer which uses the CARL integrated library system. The files now available include: the General Catalog (the ASU Libraries' OCLC cataloging), six H.W. Wilson periodical indexes (Applied Science & Technology Index, Humanities Index, Social Sciences Index, General Science Index, Business Periodicals Index and the Education Index), Grolier's Academic American Encyclopedia, the Map Index (locally produced), the Solar Energy Index (locally produced), the Arizona and Southwest Index (locally produced), three Career Services databases, Arizona Statistics (statistical tables, locally produced), the Song Index (locally produced), Performance Tapes Index (locally produced), National Indian Education Clearinghouse Directory (locally produced) and a gateway to a database called UnCover.

The UnCover database is a table of contents indexing service for over 10,000 journals and is loaded on the CARL/Denver computer system. It is accessed via a leased line and when a patron selects this option from the screen, is transparently connected to this remote computer system. Once in the CARL/Denver system, over 70 additional databases and library catalogs are available. Thus from one OPAC screen at ASU, a patron has access to almost 100 databases and library catalogs.

With over 50 library catalogs available to the ASU library user along with all of the other types of databases, the opportunities for resource sharing become obvious. Users, can now easily identify resources and citations not locally available, thus putting a greater demand on ILL, reference and eventually collection development (e.g. Why does the University of Wyoming have this title and we don't?).

NETWORKING

The networking of integrated library systems certainly represents one of the major trends in library automation. Computer networking can be done at a number of different levels and opens the door for a whole variety of resource sharing opportunities.

Some of the major networking models which appear to be congealing in today's marketplace are as follows:

1. Regional library systems using the same software. Many states and regions are choosing to cooperate through the acquisition of a common library system. Regional networks have the advantage of shared costs so that the per library costs are reduced, the ability to share locally loaded files, and a common search interface for all databases. Examples would include the Colorado Alliance of Research Libraries (CARL), LUIS the Florida consortium of academic libraries using NOTIS, ILLINET the Illinois consortium using and Melvyl (University of California system). At ASU agreements have been reached so that Northern Arizona University and the American Graduate School of International Management (AGSIM) will be loading their library catalogs on ASU's platform.

2. Some libraries are beginning to offer access to other libraries using disparate systems on the Internet or with direct leased lines through their OPAC. The direct linking of disparate library systems may be done using TCP/IP or OSI as the computer networking protocol. An example would be a project now underway between ASU and the Maricopa County Community College District wherein ASU's CARL system will be linked with MCCCD's DRA system. When users select the other system from the menu, they will be transparently connected to the other system BUT must search the remote system in its native search protocol.

3. Linking a variety of integrated library systems but developing a translation program so that users can use one search interface. This has been done with project Irving in Colorado, although it has proved to be very expensive and has experienced a number of other problems.

4. Linking a local system with other commercial or non-profit vendors such as OCLC's EPIC, RLIN, Dialog, NLM's Medline, etc. In this scenario a local system would provide a gateway to a commercial service where either the user or the library must then pick-up the tab for the connect-time and hit charges.

Obviously, the above models are not mutually exclusive and in many instances libraries involved in networking are active in one or more of the above areas.

Some of the implications of networking are monumental. In the same way that libraries cannot acquire every book or journal, it is also impossible to acquire every database. Thus through computer networking and telecommunications links, libraries and users will be able to access the world of databases with the local computer merely acting as a node or switching point.

This will bring to the user the possibility of identifying not only document surrogates (still requiring further action through the computer network or through a local library) but also, in many cases, the actual data necessary to meet their need.

THE INTERNET

"The Internet, a network of interconnected computer networks, provides the basis for this resource sharing among universities. It is the physical nexus for hundreds of campus local area networks, regional research networks, and national backbone networks (such as the NSFNET and the NASA Science Net), providing communication among heterogeneous networks."

The genesis of the national Internet was in 1985 when the National Science Foundation (NSF) funded a program to establish and link five national supercomputer centers. As part of this initiative a national telecommunications backbone was created which was to link these five supercomputer centers with the NSF-funded National Center for Atmospheric Research (NCAR) in Boulder, Colorado. Quickly the network was to grow beyond the original linking of six backbone nodes for several dozen networks to a large system connecting over 280 networks. Through this project NSF became the lead agency in the development of a national telecommunications initiative.

The flow of data on the Internet has doubled almost every six months with over 280 academic institutions and research centers being connected. In addition, over half a dozen international connections have been made with overseas networks in Europe, Canada, Mexico and other parts of the world. Some of the major regional networks to be connected to NSFNET to create the INTERNET include JVNCNET, NYSERNET, PSCNET, SURANET, MERIT, NCSA, SESQUINET, MIDNET, USAN, WESTNET, SDSCNET, BARRNET and NORTHWESTNET.

Due to the increasing data load a new NSFNET backbone was installed in 1988 increasing the bandwidth by 30-fold from 56K Bps to 1.5 Mbps (T-1 link) between the major nodes. This upgrade was accomplished by MERIT Inc. at the University of Michigan along with MCI and IBM. A phase II expansion began in 1990 with T-3 lines (45 Mbps) on the major backbone. By the end of the 1990's a three-gigabit per second backbone has been recommended although many researchers feel that this will still not be fully adequate to support the increased needs by the end of the millennia.

In May 1989, Senator Albert Gore Jr. introduced S.1097, the "National High Performance Computer Technology Act of 1989" which would authorize a federally funded National Research and Education Network (NREN) expenditure of $400 million over 5 years to upgrade the backbone to the 3 gigabit per second level by as early as 1996. This initiative is under debate in Congress and will be reconsidered in the 1991 Congress although there is debate over some portions of the bill.

Networking Protocols

Since the Internet links a wide variety of computer systems, it was decided that all connections should be made using the Transmission Control Protocol/Internet Protocol (TCP/IP) which was originally developed on the ARPANET in the 1960's to link computing facilities in government agencies and in universities.

TCP/IP is a heterogeneous computer networking protocol supported by most major computer manufacturers and ensures that users have interactive terminal access (Telnet), file transfer protocol (FTP), simple mail transfer protocol (SMTP) and other standard capabilities.

At some point the Internet will also be supporting the Open Systems Interconnection (OSI) model which is a completely new heterogeneous networking protocol suite developed by ISO. This newer set of standards is a seven-layer model for communications which promises, in the long run, to support more users and will provide greater levels of compatibility.

Library Connections to Internet

Although funding for NSFNET and the Internet was largely driven by the need to transmit data between supercomputers the use on the network is open to any qualified user. As of early 1990 over 60 library online catalog systems are available to researchers on the Internet. Even as recently as two years ago only a few libraries or library systems were connected to the Internet.

Libraries have long been innovators in resource sharing via interlibrary loan, shared collection development activities and in other areas. It is only natural that the bibliographic riches of libraries should be shared via this national network. Since many libraries are loading other databases (indexing services, reference tools, special collections, etc.) beyond their basic MARC records, a growing wealth of information will be available on the network.

To connect a library system to the Internet the TCP/IP protocol must be used. To accomplish this several techniques are commonly preferred. For example, a library may add an ethernet controller to its computer and add the TCP/IP software to provide a connection at the academic institution; if the library computer does not directly support TCP/IP a terminal server could be used to provide this connection; or several other options are available. In many instances state-wide library systems such as MELVYL in California or CARL (Colorado Alliance of Research Libraries) in Colorado provide access to an entire array of libraries and databases within a state or region.

Using Internet, Problems, and Impact

One of the major draws for using the Internet instead of regular dial-in phone lines is that most organizations pay for Internet access on an institutional basis and do not pass this cost directly to the user. Hence, long distance phone charges are avoided.

One of the big issues on any campus is how to get access to the Internet. In most cases users must be somewhat computer literate in that they need to learn how to get into the campus TCP/IP network, get into the Internet, properly enter an IP address, and then know what to do when connected to the computer at the other end. Once a user is connected to a remote online catalog, users must learn the logon sequences, search protocols and commands of that remote system; TCP/IP does not do this for the user. If a user can access multiple databases at a remote site, (s)he must be aware of the usual pitfalls of multi-database searching (e.g. different sets of controlled vocabulary or which fields are indexed).

Some systems support only a limited number of terminal emulations and the user will need to set the communications software to match the online catalog in question. Many systems have only limited online help screens, poor error messaging, or cryptic abbreviations. These types of questions are more problematic when there is no reference librarian to ask.

Many commercial databases which are loaded in a local online catalog have copyright or licensing restrictions. Quite often these files are passworded to restrict use to qualified patrons. Many libraries are not fully retroconverted and it is often difficult to determine exactly what portion of the collection is being searched.

Since most of the files available through the Internet are not full-text but provide only bibliographic citations, the user must still obtain the full document via interlibrary loan or through some other mechanism.

NETWORKING AND LIBRARY SERVICES

In a handy phrase what the networking of library databases creates is the library without walls or the virtual library. The historical tie of the patron to the collection has been severed--or attenuated severely. By our own hand on the rapidly spiraling technological wheel, we have given library users great powers of access, both in the sense of "access to access" and access to information than was previously imaginable.

Put another way, one that should take most of us back to our library school pasts, we have moved appreciably closer to the Ranganathian goal of "every reader, a book, every book a reader." When we first heard this quote in library school most of us probably thought it very zen or a very fancy way of saying that cataloging should be a system which clearly identifies the subject and location of a book. The finding and locating function of the library classification system becomes one and the same.

This was the cataloger's ideal and serves as a model for what librarians try to achieve. Now Ranganathian thought it possible to put the book into the hands of the reader through the classification system itself. In the real world this meant coming up with classification schemes like DDC and LC and then union catalogs, interlibrary loan networks, and resource sharing. The classification systems helped you find a book by subject and locate the book within your collection. The union catalogs helped you--or more precisely it helps your library and its interlibrary loan office--to locate the book somewhere in the vast universe of lending libraries.

The point of our first section of this paper is that networking library databases signficantly changes how libraries realize the Ranganathian dream at two levels. At one level, let's call it the grand mission level, networking library databases changes the overall mission of the library from one of helping users find books in a collection to that of helping users find information. Period. That information could be books, articles, reference text, data, pictures. But the library is no longer limited to the collection it develops or houses. It is an electronic clearinghouse.

The other level is the librarian's level. This is the level caught by each one of your own impressions--at least those of you who have experienced changes brought along by automation--that the old tools aren't being used by you or your patrons in quite the same way anymore. For example, your patrons access Magazine Index via a gateway to a system in Colorado. Effect: they don't seem to use the printed Reader's Guide anymore. Or your patrons have access to over 50 library catalogs outside your city. Effect: suddenly they discover ILL en masse. Or your students dial into the university system that has a database on art literature. Effect: you cancel your subscription to that expensive art index. Or you don't get involved in much or any of these networking hijinx. Effect: patrons annoy you with invidious comparisons about what the library over that side of the city manages to do for its patrons. Or a patron walks up to you at the reference desk, with a mile long length of computer printout, wondering why he can't find the items in the

collection (because they are part of some other collection accessible through your system). Effect: this patron is lost in the funhouse of information.

The list goes on. We will delve into the issues behind these observations in a minute. Suffice it to say that change is sweeping gale force through libraries and it is change brought about by the formidable resource sharing power of networking.

To better understand the impact and resulting issues of networking databases, we would like to engage you in a discussion of how networking and the traditional library services of reference, instruction, collection management, and interlibrary loan handle the following question. It is a variation of the Ranganathian axiom, rendered in a modern idiom by Dr. William Potter, Director of Libraries at the University of Georgia. Writing about the online catalog (and I will now amend it for the online catalog tied to many online catalog) Potter reminds us,

> *Remember, his or her (the patron) question is not 'Does the library own this book?' or 'Where is the book located?'. Rather, the question is 'Can I have this book?'*

And as we know, it doesn't stop there. The operative question at the reference desk is not even " Can I have this book?" No, it is " I'd like some information about..."

Let's keep this question in mind in the following discussion.

Collection Management

Traditionally, libraries have purchased holdings based upon perceived mission or their best sense of what users wanted and needed. Libraries emphasized ownership of books and serials and intended the use of the collection for local borrowers.

Behind the resource sharing philosophies of the 60's was the notion that because of the rapid expansion of publishing, no single library could maintain collections that met the needs of every borrower. Resource sharing agreements grew out of the perceived need to supplement local collections through the extramural collections of state, regional, national, and even international libraries. Union catalogs and serials lists were created as joint efforts to help locate materials to lend and borrow.

A guiding principle of collection management has always been to keep collections consistent with the findable records of items in the collection. For example, to build a decent psychology journal collection a library buys titles indexed by the most comprehensive index to the literature, *Psychological Abstracts*. Such indexes were in fact general arbititers of collection building. So much so, that in every academic library you are not likely to find every psychological journal published but you are without fail going to find *Psychological Abstracts*.

Building book collections follows different paths but at the heart there is also a similar principle at work. New collections are often modeled after the holdings of other established collections. These holdings are generally recorded in dictionary catalogs or other types of bibliographies. Unlike the major journal indexes, these union lists may not be widely used finding tools but they are the finding tools that were used to create the collection.

When we network library systems to provide access to other local collections and to electronic databases used by other libraries or self-standing services, we infinitely expand the virtual collection of the user. Remember, the patron wants the book or article. He or she has found it in one of our databases. The question for librarians now is, under what circumstances should we have a particular item available to a local patron and when should it be borrowed from another collection, instead of buying a copy and adding it to our library.

The problems succinctly put is how do we buy for the virtual collection? From what we've read in the literature, librarians do not have a clue about this dilemma. Typically cooperative development programs are proposed, some are even developed. The general impression, however, is that they are not overly successful. To confirm this just ask yourself how many cooperative collection development programs are familiar to you. Of those you know about, can you articulate just how cooperation is achieved in actual practice?

One major reason that cooperative programs are less than easy to sustain and make effective is that we do not have spelled out methods for collecting, analyzing, and distributing information about what users want and how libraries go about meeting user needs. As a result, libraries lack the ability to reasonably anticipate user demand and do not completely comprehend what the terms of cooperation should be. Cooperation then becomes more of a poker game, players holding cards close, faces blank. Next moves are guessed at, determined by suspicion and only a partial understanding of what the others are doing.

These problems remain with us when we develop our electronic holdings. In a networked environment, what databases should the library buy for local consumption or networking lending? Which databases, print or electronic, already subscribed to should be cancelled if there is network access?

Such questions arise not only because they are practical--who wants to pay twice for the same thing--but they are made urgent by the high costs of information. Presently, print collections are evaluated by size and ownership still perceived as more important than access. At the same time print collections, given the growing emphasis on information, are costly to house. And from a librarians point of view perhaps even more costly if information within the collection cannot be accessed.

To deal with the issue of access versus ownership, collection managers will likely have to develop skills of conspectus management. Using the data of the ARL Conspectus, a detailed and systematic synopsis of research library holdings and collection development, collection managers can analyse ILL borrowing/lending data in conjunction with the Conspectus to better assess current demands on the collection. They can also consult with reference librarians to help direct patrons to collections (and the finding tools of those collections) that better serve the patron's needs.

Reference

Reference librarians working in a networked environment face several crucial dilemmas that impact on the quality of service they can provide. The role of the reference librarian is to help find the book or article or to provide the information. This may involve helping the patron to use the various finding tools, which in a networked environment, means navigating around a wide variety of databases and extramural collections--an instructional task. Or it may be using the databases themselves to find an answer, a fact, or "the

information"--a database searching task. Both require learning and continued learning of search protocols, keeping up with scope and coverage of databases, and a constant reappraisal of the information needs of patrons and their informational literacy.

These are no small tasks and require that libraries direct attention to updating the skills of reference librarians. The instructional effort of libraries, always directed toward the patron, may deserve in some part to be redirected toward staff.

The reference librarian is also caught in a dilemma of trying to meet the information need of a patron whose demand can only be met through access to an extramural collection. If you are a reference librarian you know this reality: patron finds an item not in your collection, needs the item yesterday, and is perplexed, confused, angered, that you cannot supply it. Of course, you have the option of telling the patron that "that's life" or "try again" but you can suppress some guilt that you are not not measuring up. That somehow the expectation, fired by your automation extravaganza,does not have follow through.

In many ways networking has led to expectation brokering at the reference desk. Networking creates the potential to expand the types and degree of research in which a patron may hope to engage. For example, research that at one time required the patron to make a journey to a library holding the research materials, now can be largely accomplished from a research site remote from the target collection. As we all know, however, it can not be entirely accomplished. Here the task of the reference librarian is to somehow manage the process for the patron, arranging what can be done and explaining what cannot be done. And what can be done is likely to change as automation evolves.

The networked environment also creates the foreign user. Patrons who are unfamiliar with your collection wander in and expect and deserve assistance. They are not, however, your usual clientele, who may have been instructed in use of the library or somehow know the ropes. The foreign user, perhaps a citizen who has dialed into your network, a community college or high school student whose library is networked with yours, comes in and is familiar with his or her library but not yours. In effect, they do not know your language. Reference then becomes the often tedious and laborious task of translating how a research library works and adjusting one's research expertise to the perhaps less than research quality abilities of this user.

Finally there is just the plain difficulty of explaining this new era of reference to users. Change has been sudden and the impact on reference work drastic. The librarians themselves are bewildered and regrouping.

Instruction

Networking library systems and the virtual collection alter how library instruction must approach its tasks. New types of users must be considered and new concepts of how library tools work need to be presented. Instruction has the important job of continuing education for staff. Instruction also should consider the important role of public relations--keeping the library community informed about rapid change in library services and the means of doing library research.

Library automation in general has increased use of the library. A user-friendly online catalog makes library users of those who used to avoid the library as "that difficult place." Networking has brought new users from outside the library's immediate community as it has created what instruction librarians call " the invisible user." This user is generally defined as the person who is dialing into the library system and using the system without

the traditional support services of the library. The general solution proposed by instruction librarians is to somehow extend this support to these invisible people.

Such support--more attempts to identify and school this user, more written documentation that can be sent out, etc.--is necessary and worthy. However, in a networked environment the invisible user is even more near at hand than imagined. Many librarians conjecture that computer use from office, home, and from within the library, has led to users by-passing library support services. They argue that patrons, lured by the ease and seeming swiftness of computers, do not use the machines efficiently or even correctly. Reference librarians observe that however many patrons do seek help there are countless others that don't. Looking over the shoulder of many patrons one observes many misuses or less than effective search techniques.

The domain of users is no longer that of the library's local community. Many high schools, whose collections and online systems (if any) are inadequate, use local college and university collections. They dial up, they network in. Community colleges do as well. Through networking, outside students use the larger libraries as if they were their own. Often these students continue their studies at the university whose library they used prior to enrolling. Instruction needs to somehow work with high school and community college librarians to help these students use the university library's collection and services. This will help the student prepare for higher studies and will also help the library meet its service demands.

One emerging group of users that bears watching and warrants acknowledgement by libraries is the network user. As Edwin Brownrigg of the Memex Research Institute points out, these users more than any other service seek library services. Network users are those whose jobs or inclinations make them turn to computers as daily tools for living. They were early users of the so-called "by-pass" technologies of electronic mail, facsimile, and other uses of the computer for communicating. To these individuals, downloading, Internet, NREN are not cabalistic terminology but daily, comprehensible vocabulary.

Now there has always been an unheralded truth about scientists, professors, administrators, and business people--key constituents of the network nation--use of libraries. It has been low or nonexistent. Whether because of the time, effort, or cost, these users have always relied more heavily upon informal networks of communication to gather and share information.

As libraries have gone online, however, there has been a growing use of heretofore untouched library resources and services. We all sense this. The networking of library systems has created opportunities for network users to more conveniently and effectively use information.

These users are likely to have a signficant impact on library services. They have impact on what we collect, what databases we buy or network, the type of reference demands we will experience, the type of reference service we will have to provide. These impacts will show up in time. However, the most pressing demand will be to somehow instruct these users in what is currently available and to bring their library research skills up to speed.

Of new concepts in teaching, the most telling is the need to shift from a tool-specific approach to one that makes sense of new techniques. These techniques may challenge our traditional sense of document specific tools. Using indexes for journals and the card catalog for books makes no sense anymore. A serials list to locate journals, the card catalog to locate books also falls by the wayside. This is not to say that instruction librarians are still teaching tool-specific approaches. Rather, we haven't found a

descriptive, teaching language for library research methods. It's not easy to describe an online system that catalogs your books and other universities' books, has local and commercial databases, gateways around the world, etc. One can lapse into system talk and metaphors but the problem is to use the right tool. We need the equivalent of the sense one has of what the Swiss Army knife is all about and to be able to describe its use--clearly, coherently, and concisely. Having a common language of instruction would bring together instruction and reference functions--the reference librarian would know what users are being taught.

One of the rudest awakenings of any librarian is to realize that the large majority of the user population do not know how a library works and the purpose a library serves. Or they have their own narrow notion. Whatever the case, librarians who labor diligently to make their job and services intelligible find out that the work is always beginning, always at square one.

This is a perennial problem and it is not helped by rapid change in library technology. What the library was a year ago seems fundamentally different when we do things like network the online system. We don't even understand it or control it. We can not expect more from our patrons.

The library has a key public relations task here. We must communicate who we are, what we do and can do, and where we are going. We must do this in a manner free from professional jargon and assumptions.

Instruction could play a key role in this. Traditionally instruction has handled library orientations and publications--both attempts to present the library to users. Instruction often has the expertise, publishing means, and local contacts to do the necessary public relations. Through instruction, the library could communicate to its local community and the virtual community created by networking in a professional and convincing fashion.

This communication could convey more than simply what is happening, but could be an attempt to articulate the mission of the library and how developments in library technology and services contribute to this mission.

Interlibrary Loan

Since the 1950's, resource sharing has largely been identified with the lending and borrowing of books. After Xerox, this has been extended to the borrowing of photocopied articles from journals. Today interlibrary loan is at the heart of resource sharing. Through ILL, libraries are able to supply patrons with documents from nearly any participating library in the world. The patron need only time enough and in some instances, money enough.

Interlibrary loan in the networked environment is positioned in the best and worst place. As access is increased, so are patrons demands for the timely and cheap delivery of documents. Increasingly, even portions of documents, ie., information cold cuts, are being requested and delivered. ILL departments, just waking into the busy morning of networking yet still structured along traditional lines, are often overwhelmed by demand.

ILL departments are also placed in a key role in the networked world. Once minimally staffed by professionals and relying on the patron to provide verification of sources, ILL departments can now lay claim to being one of the more important library services. They

can argue for more staff, more equipment. They can also be proponents for library practices and policies that recognize the problems of the delivery of information under networking.

Without recognition and support, ILL departments could easily become victims of the new demand. Wrong-headed collection managers increase ILL demand by limiting collection development. An overabundance of electronic databases and misguided or wholesale unsupervised use of the databases means a deluge of requests that are either able to be filled within the library or in some other non-ILL fashion.

The point here is that all other library services must coordinate efforts to help ILL. If policies need to be set that limit delivery, they need to be defined in a manner that is consistent with the library's mission and consistent with how public service departments understand what they are doing. For example, a reference department should not be referring every patron to a current contents database whose journals are largely unavailable in the collection without some agreement how the increased demand will be handled. Similarly, large groups of users should not be instructed to rely on extramural online systems to meet research needs for books, especially if timeliness is important.

Networking does provide some automated "cures" to ILL problems, especially those brought forth by networking. The technology behind remote charging of resources is reasonably easy; policy agreements within the loaning system are usually more difficult. Onscreen messages can also strategically direct patrons through delivery routines or advise against certain expectations. At the most extreme, access can be restricted through passwords or other security measures.

Another significant option, one growing with the evolving electronic publishing industry and the networking technology is the full-text delivery of documents. OCLC's EIDOS project, AutoDesk's Project Xanadu, and CARL's IAC full-text delivery are examples. CARL, for example, provides access to the text of magazines indexed in IAC's Magazine ASAP and the Trade and Industry Index. Libraries may license access to the CARL system and connect through dedicated phone lines or the Internet network. Users then can search the IAC databases and if an article is available, they have the option to download the article to disk or receive a facsimile transmission. Users pay for the service by entering a VISA or Mastercard number.

Such full-text delivery does have the appeal of meeting immediate need. To run such a service effectively, a library must provide sufficient printer or PC workstations and some in-house accounting system to take care of errors and other housekeeping. This work may be the domain of ILL as such departments are experienced in dealing with document delivery and accounting.

CONCLUSION

Networking library systems is a rapidly expanding and evolving phenomenon among academic libraries. Existing technology allows library systems to connect to each other thus providing users access to a wide variety of local and commercial databases. The costs involved in obtaining this access varies but for the most part still remains reasonable by taking advantage of the fact that networking is part of campus computing overhead.

Networking library systems challenges library services. New demands and expectations are created. Collection managers must strike a balance between access and ownership. Expanded access to sources through networking will increase demand for

materials and what we have called "access to access." Patrons will want books, articles, and electronic databases. How these demands will be met, from the actual or virtual collection, will be the new collection management task of the 90's.

Reference librarians face the prospect of an intense, unpredictable, pluralistic, and iconoclastic use of reference tools. The general trend of almost exclusive use of computer access by academic library patrons will continue, enhanced by even greater extramural access through networking.

Reference librarians will have to manage patrons' use of these tools. New users will be encountered and their needs and limitations dealt with. The finding tools, having become more complex, will have to be taught to users and in many cases, learned or relearned by librarians. The former domain of reference, the reference collection and the collection at large, becomes a much larger territory. Documents and answers to questions can now be found for the patron from an almost infinite set of possibilities.

Instruction also takes on new management responsibilities. Reference librarians alone will be responsible for explaining the new forms of library research. In the classroom and through library publicity, instruction faces the important job of teaching university patrons how to negotiate the network world. This task is made even more difficult by the new users brought into the library by networking and by the fact that the older concepts of instruction no longer apply to the new access tools.

Finally, interlibrary loan plays a pivotal role in the networked world. Because of networking, we have much more bibliographic access than we have the means to deal with. Once having found items not held in the local collection, patrons will find their way to ILL. Typically a patron could always have a book--if he or she had time and patience enough. Whether or not ILL could handle many patrons and whether or not timeliness is a service issue are the problems. Fulltext delivery of articles via the online system remains an option but it must be administered--quite likely through ILL. More fundamental, however, is the question: can traditional interlibrary loan departments handle all the information delivery chores of the networked library?

These remarks only scratch the surface of the issues brought about by networking library systems. Full sessions of this conference could reasonably be devoted to the problems and solutions discussed in this paper. Our remarks, we hope, will serve as a stimulant.

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INFORMATION POWER AND THE SCHOOL LIBRARIAN: AN EDUCATIONAL RESOURCE

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In 1988 the American Association of School Librarians published a book entitled Information Power. This sixth edition standards text provided elementary school librarians with new guidelines for their role as librarians and new guidelines for their programs and facilities. Information Power represented a major paradigm shift from the previous five standards publications.

In 1925, compiling the data from the United States Bureau of Education's Regional Surveys of 1916-1917 and 1920-1921, C. C. Certain published the Elementary School Library Standards. In that text the role of the librarian took a secondary position to the pages of quota standards published. The quotas included: the number of librarians per student population, the number of books per student, the number of reference books per student, the number of square feet in the library, the number of stereoscopes per student population and more. While the standards did not include enforcement clauses, seven states implemented the standards as law and another thirty states adopted the requirements as potential quantity standards for their elementary school libraries.

The 1925 edition of the standards was updated in 1945, 1960, 1969, 1975 and again in 1988. The titles of the editions seem to capture the transformation of the elementary school library over the last sixty-five years: *Elementary School Library Standards* (Certain, 1925), *School Libraries for Today and Tomorrow, Functions and Standards* (Committees, 1945), *Standards for School Library Programs* (AASL, 1960), *Standards for School Media Programs* (AASL and NEA, 1969), *Media Program District and School* (AASL and AECT, 1975), and *Information Power* (AASL and AECT, 1988). While the quota numbers printed in each succeeding edition changed, the basic idea of quotas remained until *Information Power* was printed.

Information Power was seen as an edition of change; instead of standards, there were now only guidelines. Examples of exemplary libraries included in the appendices were the only items still resembling quotas. The guidelines for the library programs and facilities were discussed in the text. The role of the librarian now was divided into three specialized areas: informational consultant, teacher and information specialist (see Appendix A).

With the publication of the new guidelines for elementary school librarians came the typical question: How effective are the new guidelines? From that generalized question I began to formulate the hypothesis for my research. I wondered if the newly published or advocated role of the librarian was reflective of the practitioners' role of the librarian. The null hypothesis which I selected was: There is no significant difference at the .05 level between the advocated role of the librarian and the perceived role of the librarian. Two other supporting hypotheses were investigated (see Appendix B). The advocated role was the published guidelines in *Information Power*. The perceived role was the subjects' rankings of those guidelines on a questionnaire.

In this study two groups were surveyed. The members of one group were practicing librarians from one school district in a large metropolitan area. The other group's members were preservice librarians who were students in a college cataloging and classification class. Significant details of the population's description were: the 13 female and one male subjects ranged in age from 30-58 years old; they had an average of 9.2 years of classroom teaching experience; the practicing librarians group had an average of 12.8 years of librarianship experience. Three-quarters or more of the subjects were pursuing another degree or endorsement. They also were involved with committee work in their individual schools and were members of one or more professional organizations. The subjects of this study were seen as highly educated, highly experienced and academically current in the field of library science.

The questionnaire was a listing of the statements from *Information Power* of the guidelines for fulfilling the roles and responsibilities of the librarian (AASL and AECT, 1988, pp. 38- 39) (see Appendix C). Following the statements were two Likert scale options. Using a questionnaire format copyrighted by Richardson, Kimball, Wolf, Kleemann, and Bechard in 1983 (Highum, 1986), the individuals were asked to respond to each question twice. The first opinion recorded was for the "importance to do" the guideline. The second opinion recorded the degree to which the guideline was seen as "being done well". The second opinion provided an option for "not being done or no opinion".

From the results of the questionnaire, the null hypothesis was rejected because a significant difference existed between the advocated and perceived role of the librarian. If we take a look at the group means for the 18 guidelines, we can see that the subjects for the most part agreed that the guidelines of the advocated role were "important to do" (see Appendix D). But when the "important to do" means were compared with the "being done well" means, the significant difference became apparent (see Appendixes E and F). T-tests were run on the mean differences between the items. 17 of the 18 items were significant at the .05 level, 9 items were still significant at the .01 level, 5 items continued to be significant at the .005 level and 3 items remained significant at the .001 level.

Let's look more closely at those three items at the .001 level. Guideline #1 on the questionnaire read: The librarian as an instructional consultant should participate in building, district, department, and grade level curriculum development and assessment projects on a regular basis. The subjects agreed that being involved with curriculum development and assessment is "important to do" but at the present time such participation is perceived as not "being done well".

The other two guidelines were in the area of the librarian as a teacher. Guideline #9 stated that the librarian as a teacher should offer to teachers and other adults learning opportunities related to new technologies, use and production of a variety of media, and laws and policies regarding information. In other words, librarians should have in-service programs on library services. The subjects' responses indicated that having such in-service programs is "important to do" but seldom are in-service programs on library services done.

Guideline #10 stated that the librarian as a teacher should use a variety of instructional methods with different user groups, and model the effective use of newer media technology. In other words, teaching with a variety of strategies and technology is "important to do" but, as teachers, librarians do not perceive a variety of strategies and technology in their lesson plans as "being done well".

The only item which was found to be congruent between the advocated and perceived positions was the guideline which stated that: The librarian as an information specialist

should provide students and teachers access to the library media center and qualified professional staff throughout the day.

When t-tests were run for the within group mean differences, the impact from the two survey groups could be implied (see Appendixes G, H, and I). The pre-service librarians generally ranked the guidelines higher in the area of "important to do" while the practicing librarians ranked the guidelines higher in the area of "being done well". A common sense notion of the situation would have suggested a similar conclusion. Students learning about a field see all guidelines for that field "important to do" while practitioners have learned to prioritize guidelines. The reverse is true of "being done well". The preservice professionals perceive the field as needing their expertise to improve it, while practitioners recognize that they are doing the best they can do in their situations.

Let's take a look at two examples of within group differences from the questionnaire. Guideline #12 stated: The librarian as an information specialist should establish access to the library media center collection by an accurate and efficient retrieval system that uses the expanding searching capabilities of the computer. In other words, implementing computer systems for retrieval and circulation was ranked as more "important to do" by the preservice librarians than by the practicing librarians. Preservice librarians also perceived that computer systems were being used more in libraries than by the practicing librarians.

Guideline #16 stated: The librarian as an information specialist should establish policies and procedures that ensure access to information which is not impeded by fees, loan restrictions, or online searching charges. While practicing librarians and preservice librarians ranked policies and procedures as nearly the same for "important to do", the practicing librarians ranked the item higher in the "being done well" category.

So, what does the rejection of the null hypothesis tell us about the publication, *Information Power*? I believe four points of implication may be offered. First, simply publishing the book does not change the practice. However, I would compliment ALA for all the teleconferencing and information which has been produced to assist librarians with the understanding of this document. With the passage of time, practices will change as more portions of the advocated role become the modeled role.

Second, the advocated guidelines for the librarian's role are just that, advocated, a written statement for the ideal. While we do not live in a utopia, we do need to have goals which provide us with challenges. The significant difference at the .05 level suggested that advocated goals have not been accomplished.

Third, the perceptions of the advocated role provide librarians with multiple avenues for partnership with students, faculty members, administrators and the community. Individual librarians like their individual schools have differing areas of strengths. The multiple avenues within the guidelines, instructional consultant, teacher, and information specialist allow for those individual differences.

Fourth and final is that the advocated role may be implemented as an elementary school librarian scaffold for evaluative dialogue. The subjects indicated that the guidelines were "important to do". As a scaffold, the discussion of the guidelines, which are action statements, will highlight the strengths of the librarian in three areas: informational consultant, teacher and information specialist.

As with any survey, definite limitations to the generalizability of information exist. However, I did find the instrument to be reliable, and I hope that further studies on the congruence of the advocated and perceived roles of the librarian will be conducted.

APPENDIX A

ADVOCATED ROLES OF THE LIBRARIAN

Instructional Consultant

* curriculum development
* assist classroom teachers
* systematic development
* provide leadership

Teacher

* integrate information curriculum
* material selection
* jointly teach information curriculum
* access interlibrary materials
* in-service program
* vary strategies and technologies

Information Specialist

* collection development
* effective retrieval system
* assist students
* flexible scheduling
* policies and procedures
* publicize new materials
* access to remote sites

APPENDIX B

Research Questions

1. There is no significant difference at the .05 level between the advocated role of the librarian and the perceived role of the librarian.

2. There is no significant difference at the .05 level in the advocated role of the librarian between preservice librarians and practicing librarians.

3. There is no significant difference at the .05 level in the perceived role of the librarian between preservice librarians and practicing librarians.

APPENDIX C

THE ROLE OF THE PUBLIC ELEMENTARY SCHOOL LIBRARIAN

Directions

Please answer each of the statements on this survey. Each statement asks you to answer two questions:

1. Is this important to do? Here you show how much you agree that the activity is important for librarians to do. **Everyone should answer this question.**

2. Is this being done well? Here you show how much you agree that the activity is now being done by librarians. If the activity is not being done currently by librarians or if you have no information about the activity, a separate response is provided.

Cross through one number after important to do and one number after being done well.

Not Being Done or No Opinion
Strongly Agree
^ gree
Neutral
Disagree
Strongly Disagree

The librarian as an instructional consultant should...

1. Participate in building, district, department. and grade-level curriculum development and assessment projects on a regular basis.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

2. Offer teachers assistance in using information resources, acquiring and assessing instructional materials, and incorporating information skills into the classroom instruction.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

3. Use a systematic instructional development process in working with teachers to improve instructional activities.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

4. Provide leadership in the assessment, evaluation and implementation of information and instructional technologies.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

THE ROLE OF THE PUBLIC ELEMENTARY SCHOOL LIBRARIAN page 2

Cross through one number after <u>important to do</u> and one number after <u>being done well</u>.

The librarian as a teacher should...

Not Being Done or No Opinion
Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree

5. Teach the information curriculum as an integral part of the content and objectives of the school's curriculum.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

6. Include instruction in accessing, evaluating, and communicating information, and the production of media as a part of the information curriculum.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

7. With teachers, jointly plan, teach, and evaluate instruction in information access, use and communication skills.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

8. Provide assistance in the use of technology to access information outside the library media center.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

9. Offer to teachers and other adults learning opportunities related to new technologies, use, and production of a variety of media, and laws and policies regarding information.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

10. Use a variety of instructional methods with different user groups, and model the effective use of newer media technology.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

THE ROLE OF THE PUBLIC ELEMENTARY SCHOOL LIBRARIAN page 3

Cross through one number after important to do and one number after being done well.

The librarian as an information specialist should...

Not Being Done or No Opinion
Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree

11. Make resources available to students and teachers through a systematically developed collection within the school and through access to resources outside the school.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

12. Establish access to the library media center collection by an accurate and efficient retrieval system that uses the expanding searching capabilities of the computer.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

13. Provide students assistance in identifying, locating, and interpreting information housed in and out of the library media center.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

14. Provide students and teachers access to the library media center and qualified professional staff throughout the day.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

15. Schedule class visits flexibly to encourage use at the point of need.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

16. Establish policies and procedures that ensure access to information which is not impeded by fees, loan restrictions, or online searching charges.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

THE ROLE OF THE PUBLIC ELEMENTARY SCHOOL LIBRARIAN page 4

Cross through one number after <u>important to do</u> and one number after <u>being done well</u>.

The librarian as an information specialist should...

Not Being Done or No Opinion
Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree

17. Inform teachers, students, parents, and administrators of new materials, equipment, and services that meet their information needs.

Important To Do
1 2 3 4 5

Being Done Well
1 2 3 4 5 0

18. Provide students at remote sites and those with physical handicaps access to information.

Important To Do
1 2 3 4 5 with

Being Done Well
1 2 3 4 5 0

DEMOGRAPHIC AND BACKGROUND INFORMATION

1. Age _____

2. Sex _____

3. Number of years as a librarian _____

4. Number of years as a classroom teacher _____

5. Highest degree earned _____

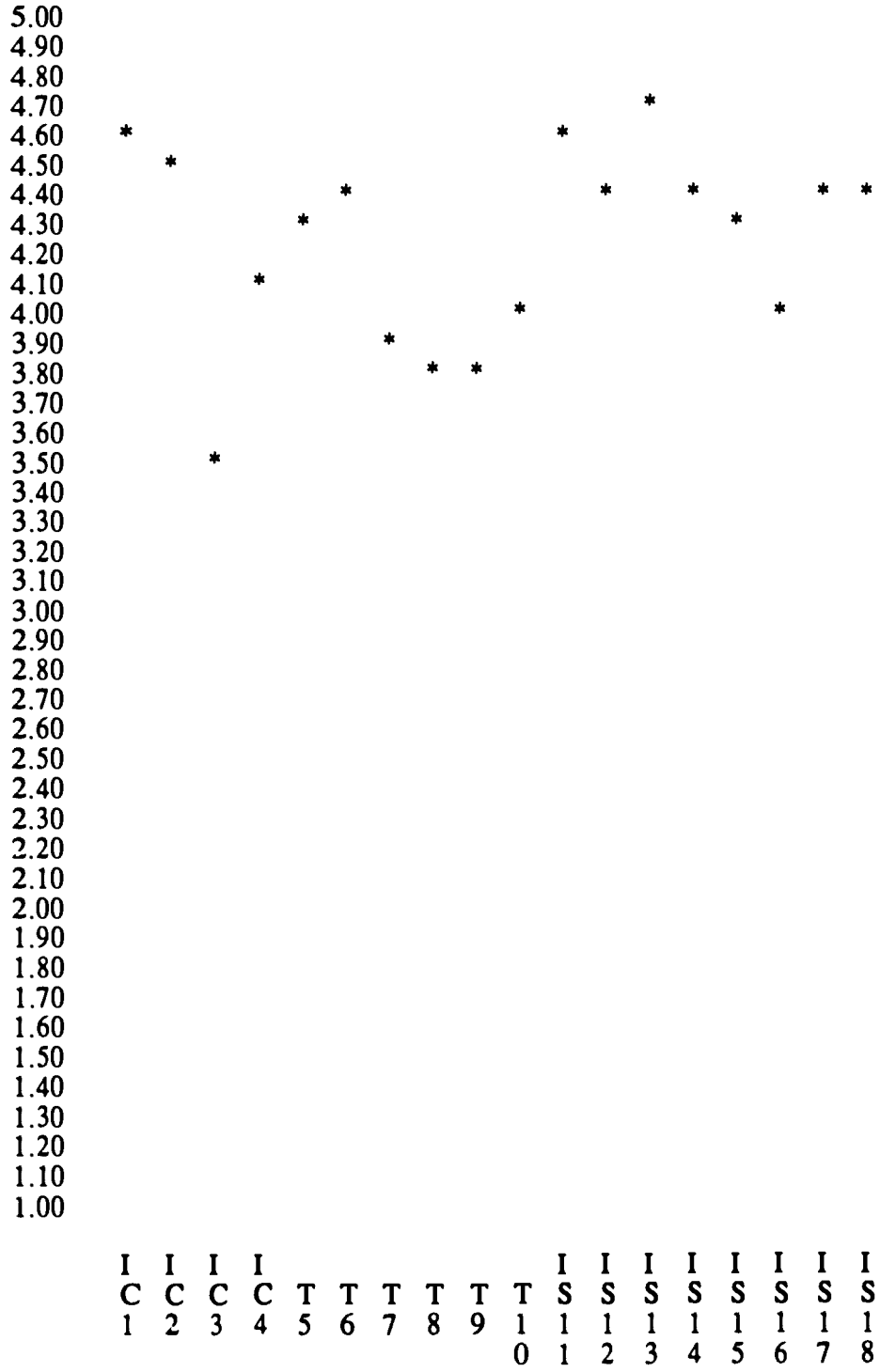
6. Degree/endorsement currently pursuing _____

7. Participation at school level (ie. steering committee, curriculum committee, public relations committee)

8. Membership in which professional organizations

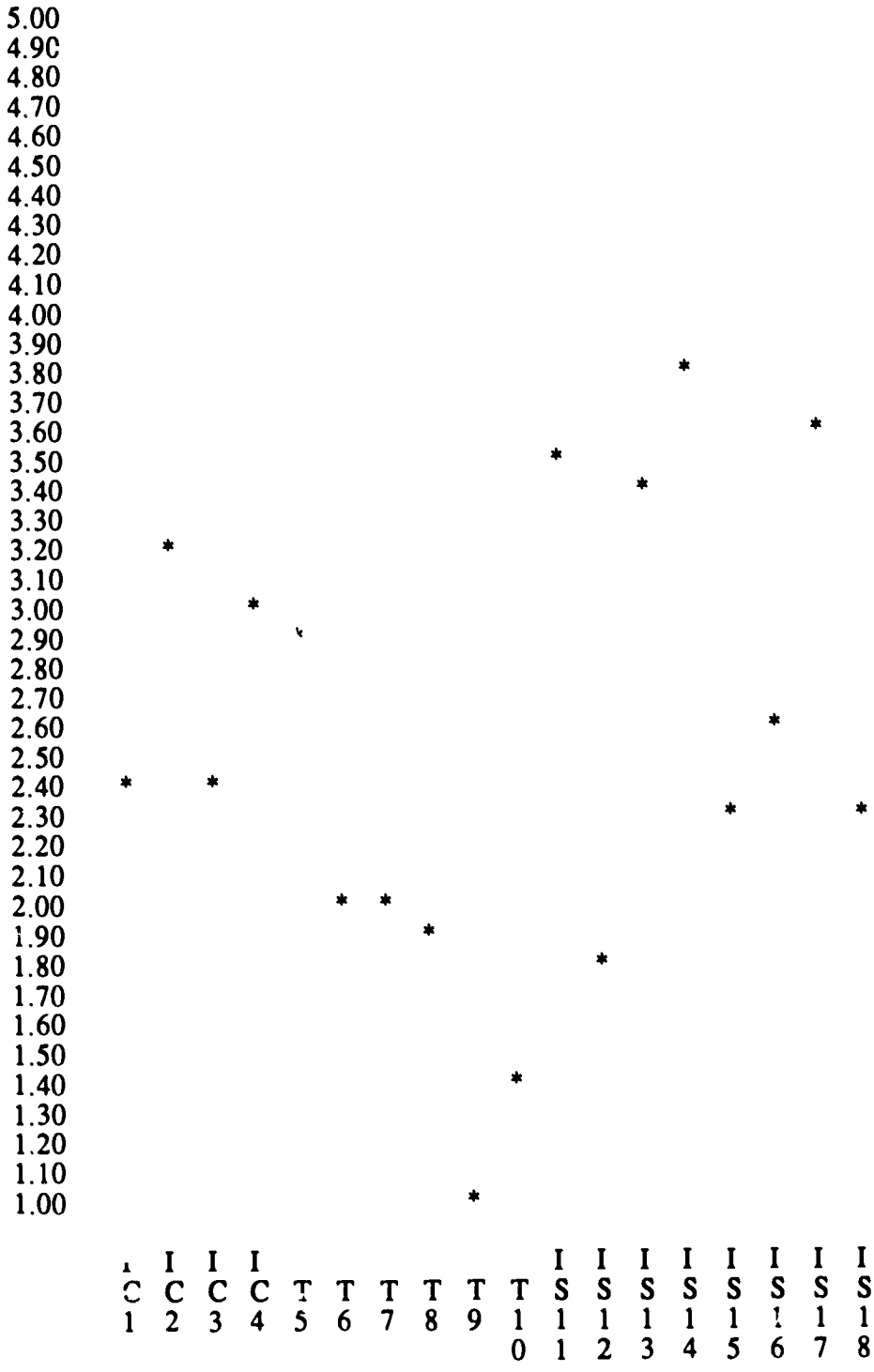
APPENDIX D

"IMPORTANT TO DO" BETWEEN GROUP MEANS



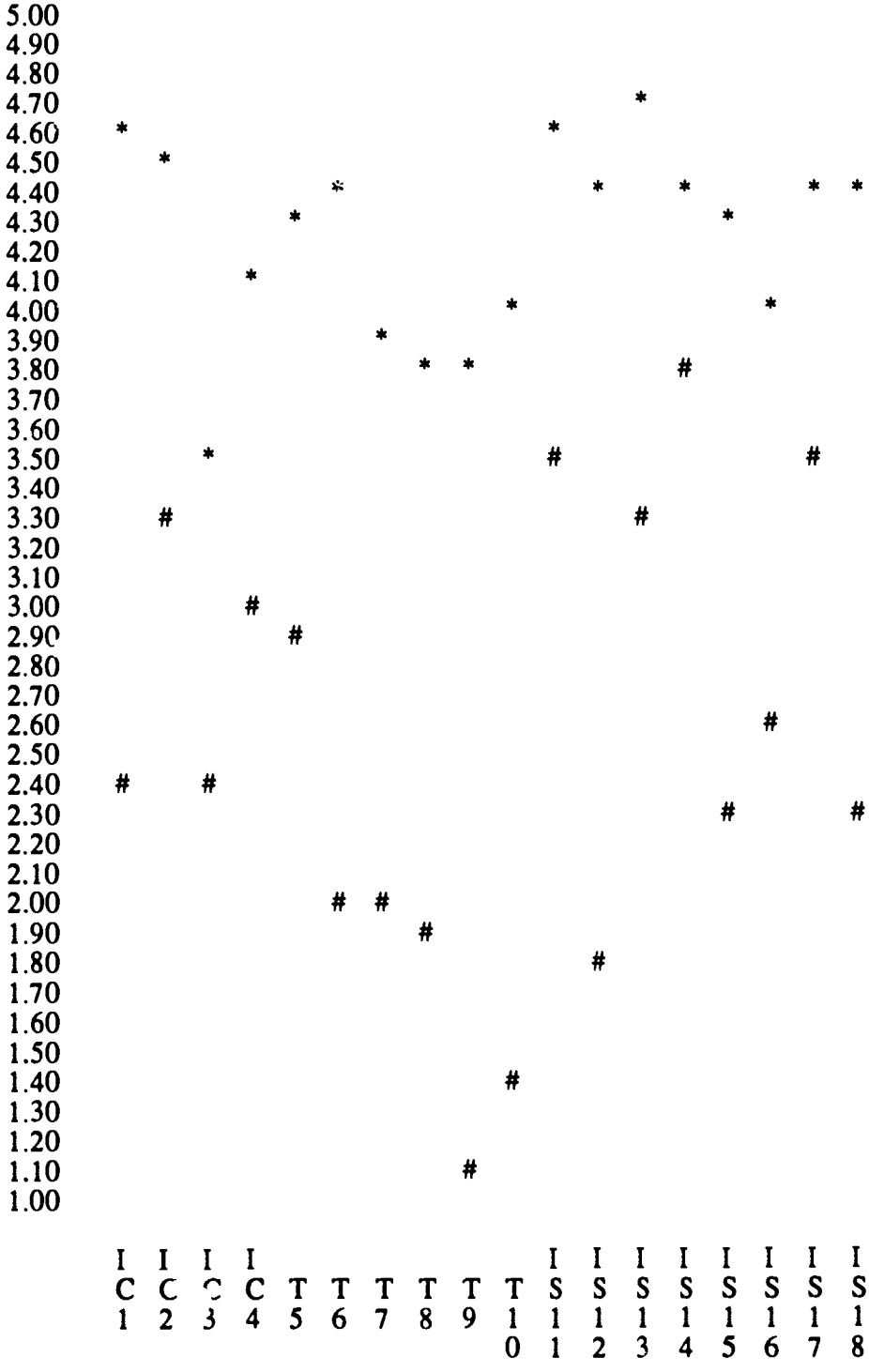
APPENDIX E

"BEING DONE WELL" BETWEEN GROUP MEANS



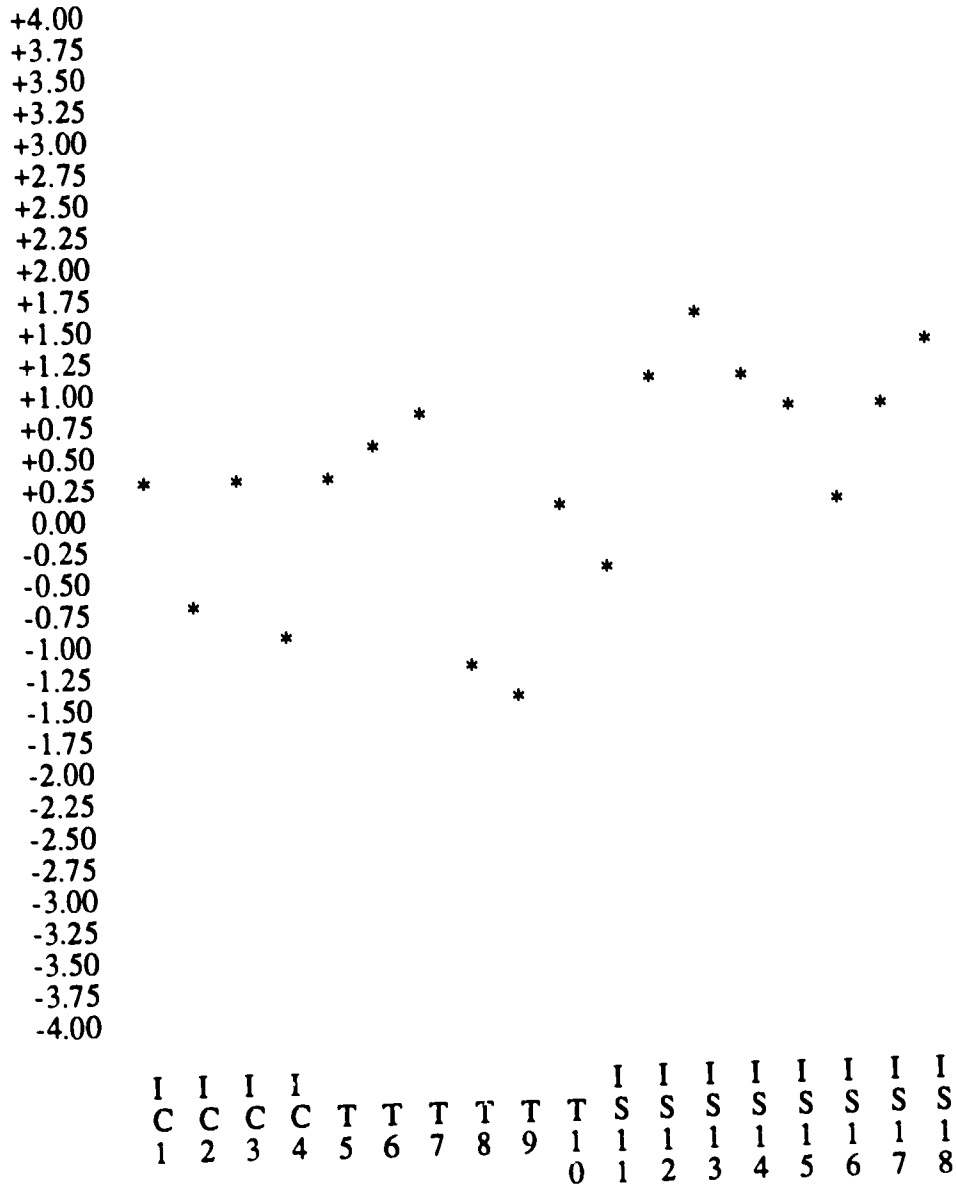
APPENDIX F

"IMPORTANT TO DO" & #"BEING DONE WELL"#
BETWEEN GROUP MEANS



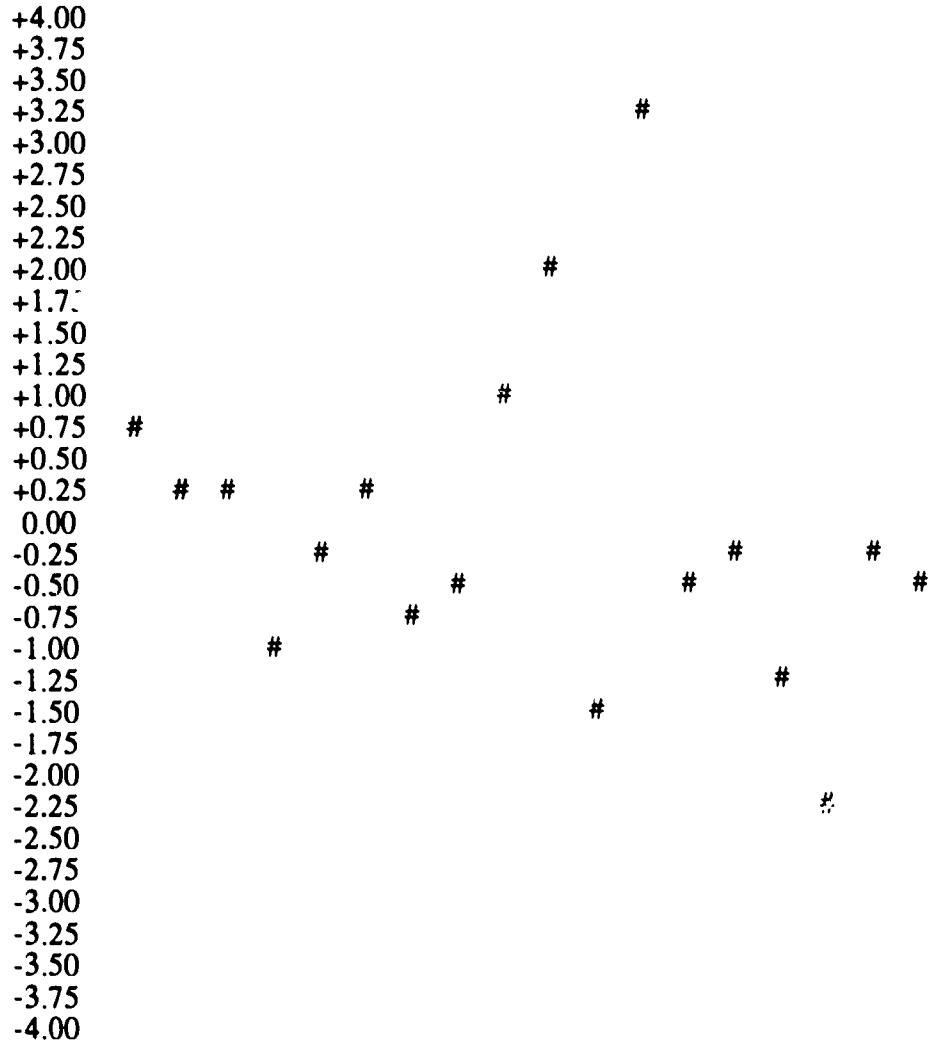
APPENDIX G

"IMPORTANT TO DC"
T-TEST VALUES FOR WITHIN GROUP MEANS



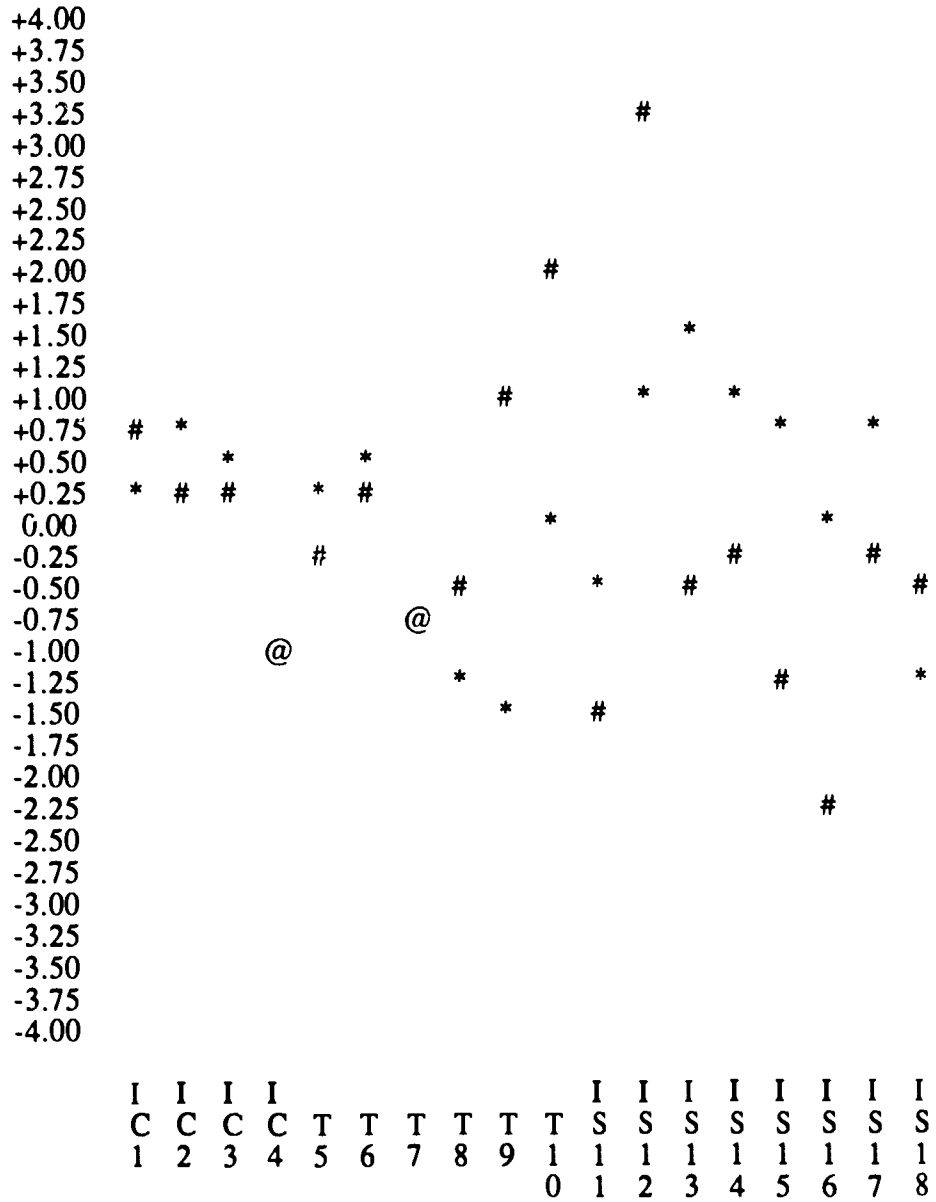
APPENDIX H

#"BEING DONE WELL"#
T-TEST VALUE FOR WITHIN GROUP MEANS



APPENDIX I

"IMPORTANT TO DO" & #"BEING DONE WELL"#
T-TEST VALUE FOR WITHIN GR(· P MEANS



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DEVELOPMENT AND USE OF ONLINE INDEXES

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During the past two years, the Music Library staff at Arizona State University has developed two indexes which support and enhance the reference service it provides to its users. The Song Index and the Performance Tape Index have proven to be very useful and popular reference tools not only for the staff but for the users as well. Most of us can testify to the usefulness of an index on any topic and wish we had more. However, one can also attest to the limitations of some of the print versions, and acknowledge the venerable and dated material found in many of them. This is especially true of the print versions of song indexes. Those of you who may have had occasion to use some of these will readily agree this to be the case. Sears' *Song Index* was published in 1966 as a reissue of a much earlier 1927 edition. De Charms' *Songs in Collections* was published in 1967. While Leigh's *Index to Songbooks,* was published in 1973, the 11,000 entries in it are from anthologies published between 1933 and 1962. The latest, Havlice's *Popular Song Index* and its three supplements, were published between 1974 and 1985. If one checks the holdings of his or her own library against the titles of the anthologies listed in these print versions, one finds only a small percentage of them actually available for use or purchase.

I keep mentioning "print" indexes in relation to song anthologies because commercial vendors do not seem to have addressed the possibility of applying technology for song indexes. However, in this age of rapidly changing technology, it is possible to develop an index tailored specifically to one's own collection through the use of the online catalog, or as at some institutions, a personal computer. The compelling reason for any library to develop an in-house index is need, and the staff of the Music Library at Arizona State University is no different. Each time a song title was requested, we held our breath hoping it could be found in the sheet music collection where each title is cataloged separately. Of course this was rarely the case. Even if the song title was listed in one of the outdated print indexes, we often found that our holdings did not include the anthology or collection in which it was located. We were then reduced to scanning the contents pages of the anthologies on the shelves to locate the information we sought.

Over the years I had often envied the resources of some libraries where sizeable card indexes had been developed for such purposes. These multitudinous card files usually existed in older, well established libraries with a long tradition of this kind of activity. However, given the youthfulness of the ASU collection, the shortness of staffing strength and the rapid proliferation of these anthologies, it never seemed possible to pursue a project on such a large scale as this.

While the idea for a song index had been in the back of my mind for a long time, the encouragement to pursue it came from one particular staff member who kept saying to me, "If we had a PC, I bet we could make our own index." So, when the PCs were obtained for the department, I seriously began to consider the idea for such an undertaking.

I presented a proposal for it to the Associate Dean for Technical Services who concurred with me that it was a good idea to be encouraged and supported. He suggested discussion with the Head of Library Technology, George Machovec. During the ensuing meeting, the idea of creating a database on a PC was discarded when Mr. Machovec suggested that it could be done directly online. Creating a database separate from the General Catalog would allow us to develop a specialized reference tool consistent with the needs of our users yet would not interfere or conflict with cataloging operations.

The project was approved by a supportive Library Administration and planning began. Throughout the planning stage, the entire Music Library staff was encouraged to participate, give their opinions, agree, disagree, and as a group come up with specific recommendations for the index. We then worked with Mr. Machovec to devise the format and technical plans which were submitted to the programmers. Basically, what evolved was a mock-MARC format which was deliberately kept as simple as possible since the work force for this project would be, for the most part, music students rather than full-time library staff.

There are a number of steps in the process of inputting information about each collection and its contents. (Example 1--Appendix A) If you look at the example, you will see the basic outline of the work screen which was developed. After the initial information about an anthology is input, the call number and title of that collection is repeated each time a song is added. Essentially, what happens is that the existing record is then modified for each song. To keep it simple, only the basic information of composer, title, lyricist and first lines are used, with provision for additional joint composers or lyricists as needed.

If you look at the next three examples you will note the similarities in the information found on the help screens of the General Catalog and those of the two indexes. (Examples 2--Appendix B,3--Appendix C, and 4--Appendix D.) It is possible to search by name and word, or browse by call number in each database. Title searches are possible as are combined word searches. Combined word searches are of special interest to some of our users who include entertainers, music therapists, recreation directors at nursing homes and retirement centers as well as the occasional caller from Sun City who is looking for a song title from 1928 "when mama and I got married." The combined word search allows these users to locate titles for special occasions or for specific themes.

The shelf list of anthologies to be indexed is compiled on the hard disk of a Macintosh PC. This serves as a log to record what has been done, who did it, and how much time was spent doing it. This allows us to monitor the work of those who input the records. To date, these individuals have all been well-trained students who are assigned this responsibility either as a specific project or something they do during the occasional slack time at the circulation desk. The level of skill of each student is taken into consideration when assigning this as some are better at it than others. Actually, the quality of their work has been quite good, but each person's work is checked and revised, if necessary, by an experienced supervisor to ensure that it remains that way.

I would now like to show you several examples of typical word searches for a song title. (Example 5--Appendix E.) This example was retrieved by a word search using "baby", "beautiful", and "mother." Four identical titles were retrieved from four different collections. (Example 6--Appendix F.) When the first title is selected you will see the screen which the patron sees. (Example 7--Appendix G.) For comparison, I have also included the work screen for this same title as seen by the person doing the input. Note, the word "mother." It was retrieved not from the title, but from the first line of the song. A word search is excellent in a song search because the patron is frequently unable to give an accurate title but may be able to recall and sing a few words in the first line.

Here is another example of a word search showing both the patron screen and the work screen. (Example 8--Appendix H.) This time the words "bedpost" and "overnight" were used to retrieve a song called, "Does the spearmint lose its flavor on the bedpost overnight." (Example 9--Appendix I.) This kind of song title engenders a lot of laughter among the student staff.

The statistics of November 1, 1990 indicated that 20,000 titles in 268 anthologies of popular song had been indexed. Keep in mind, some of these anthologies have titles such as *1001 Songs*. It takes a long time to index the contents of such a volume. The average time works out to about 18-20 titles per hour.

Why were popular song titles chosen rather than art songs or folk songs for our first effort? There are a number of clear cut reasons for doing so. Patrons seemed to need more assistance locating popular songs and we had fewer print resources on which we could rely. One of the most compelling reasons, however, was that popular song in English was the simplest type of song to use in developing the procedures for an online index. A major consideration, however, was that there were no diacritics or foreign language problems which had to be addressed in the development stage.

While the index currently contains only popular songs, it will be expanded in the near future to include art songs and folk songs also. These produce interesting challenges for indexing. Foremost among them are foreign languages and as mentioned before, their accompanying diacritical marking which the Online Catalog does not now display. With art songs, there may be more than one title or first line, one in the original language and the other a translation. This may double some of our problems and compound the problem of finding competent staff with foreign language capability to do art song input. We are hoping the problem of displaying diacritics in the Online Catalog will be solved soon so the integrity of the languages can be retained. If not, I may have some difficult decisions to make about the importance of the integrity of the languages vs. access to information in a less polished form. Foreign song titles may have to be input without diacritics.

The rapid growth of the index is quite exciting, not only for ourselves, but for patrons as well. The number of "hits" during searches has risen in direct proportion to the size of the database and it is very satisfying to be able to locate a song title for a patron.

A frequently asked question is what would be done in the event an anthology or collection is lost or withdrawn. Since this is viewed as a reference tool, no changes are envisioned. The information in the database is still valid and inter-library loan a possibility. The local call number could be removed from the record to indicate no holdings yet still retain the information for reference purposes.

The Performance Tape Index has proven to be a bit more complicated. We had been keeping a crude shelf list of School of Music performances so we would know what we had, but there was no method of retrieving information about their contents, the performers or the dates of performances. These had to be taken into consideration for this index. (Examples 10--Appendix J, and 11--Appendix K.)

While there are similarities between the two indexes, this one was expanded to include contents notes accessible by word search. (Example 12--Appendix L.) It includes all graduate recitals, faculty concerts and large ensembles of the School of Music. 638 performances have been indexed to date. This represents the current year and two years of past performances. It will be kept current. and as time permits, more past performances will be added.

This index is a valuable resource since much of the contemporary music performed in these concerts is unavailable on commercial recordings and may indeed be the only recording of a particular title. The annual "composer-in-residence" program at ASU results in many unique performances, some of which are premieres of compositions by modern composers. Making these available to our patrons is a real service, not only from the research standpoint, but the artistic as well.

I have mentioned but two of the indexes available in the Arizona State University Online Catalog. Others include the Map Index, Solar Energy Index, ASU Newspaper Index, Arizona and Southwest Index, all of which emanate from various library departments with special collections of one kind or another. One of the exciting things about developing these databases, is that the information can be shared and made available to other than our own campus users. This ability to share information is an important consideration given the budgetary restraints which most of us face.

Off-campus users have access to Arizona State University's Online Catalog, including the various indexes, by using virtually any microcomputer equipped with appropriate communications software, a modem and ordinary phone lines. A brochure explaining the procedures for dial-in access to the ASU system will be available after this session for those who are interested. Some users from around the country also have access through a telecommunication network called "Internet."

Colleagues from other institutions seem to be very interested in the development of this Song Index and have used it as a reference tool to accessing their own collections. It is interesting to note that while it may be specific to the music collection at Arizona State University, others have also found it useful. To my knowledge, no other institution has developed an online index of this type and given the proliferation of song anthologies, it has an exciting potential for those interested in music research.

An online index can be applicable to many disciplines other than those previously mentioned. What comes to mind immediately might be an index of collections of poetry or short stories. However, I am sure each of you could suggest dozens of additional ideas for useful indexes which support unique collections you may have in your own libraries. If you are interested in developing a specialized reference tool for your own collections, you may wish to explore this possibility in greater detail and experience the satisfaction we have had in using them.

APPENDIX A
EXAMPLE 1

```
LCCN:                    OCLC: 018525                    MODIFY MODE
-------------------------------------------------------------------------------
01 090:     `aM1630.18 .S47x`
02 100:   10"aCOMPOSER.`
03 245:   10`aZTITLE^
04 700:   10`aADDITIONAL COMPOSER OR LYRICIST.
05 740:   01^aFIRST LINE.^
06 830:    0^aBest songs of the 20's and 30's.`
07 CALL NUMBER: M1630.18 .B47x                  LIBRARY:   SONG  MUSIC  STKS
   REC TYPE: c       BIB LEVEL: m               FORMAT: SCORES
-------------------------------------------------------------------------------
 P  to PROCESS,  R` to REPEAT, or LINE# to edit
```

APPENDIX B
EXAMPLE 2

```
11/06/90
06:53 P.M.          SELECTED DATABASE:  ASU General Catalog

              The computer can find items by NAME or by WORD

              NAMES can be authors, editors, or names of
              persons or institutions written about in the book

              WORDS can be words from the title, or subjects,
              concepts, ideas, dates etc.

              You may also BROWSE by TITLE, CALL NUMBER, or SERIES.

              Enter   N   for  NAME search
                      W   for  WORD search
                      B   to   BROWSE by title, call number, or series
                      S   to   STOP or SWITCH to another database

              Type the letter for the kind of search you want,
              and end each line you type by pressing <RETURN>
                      SELECTED DATABASE:  ASU General Catalog

ENTER  COMMAND`>
```

APPENDIX C
EXAMPLE 3

11/08/90
08:57 P.M. SELECTED DATABASE: Songs Index

This is an index of popular songs found in collections of songs owned by the Music Library. Any song may be searched by composer, librettist, title or first line. The record will identify the collection containing the song and the call number of the collection.

Enter N for NAME search
W for WORD search
B to BROWSE by title, call number, or series
S to STOP or SWITCH to another database

Type the letter for the kind of search you want,
and end each line you type by pressing RETURN>

SELECTED DATABASE: Songs Index

ENTER COMMAND>>

APPENDIX D
EXAMPLE 4

11/08/90
08:51 P.M. SELECTED DATABASE: Performance Tape Index

The Performance Tape Index provides access to performances by the ASU School of Music. Included are recitals and concerts given by graduate students, faculty and large ensembles. The tapes are housed in the Music Library. These may be searched by performer, date of performance (i.e. 1990/2-3 - a browse by call number), medium of performance (trumpet, piano, or orchestral, and the music performed (you must use a word search for composers in this database).

Enter N for NAME search
W for WORD search
B to BROWSE by title, call number, or series
S to STOP or SWITCH to another database

Type the letter for the kind of search you want,
and end each line you type by pressing <RETURN>

SELECTED DATABASE: Performance Tape Index

ENTER COMMAND

APPENDIX E
EXAMPLE 5

10/30/90
08:38 P.M. SELECTED DATABASE: Songs Inde

This is an index of popular songs found in collections of sheet music owned by the Music Library. Any song may be searched by composer, performer, title or first line. The record will identify the collection containing the song and the call number of the collection.

Enter N for NAME search
W for WORD search
B to BROWSE by title, call number, or series
S to STOP or SWITCH to another database

Type the letter for the kind of search you want,
and end each line you type by pressing <RETURN>

SELECTED DATABASE: Songs Index

ENTER COMMAND (MAINT TO RETURN): >//WBABY BEAUTIFUL MOTHER

APPENDIX F
EXAMPLE 6

WORKING...
BEAUTIFUL 00189 ITEMS
BEAUTIFUL + BABY 00012 ITEMS
BEAUTIFUL + BABY + MOTHER 00004 ITEMS

PREPARING YOUR DISPLAY -- HOLD ON...

1 Warren harry — SONG MUSIC STKS -
You must have been a beautiful baby. — M1630.18 .049

2 Warren harry — SONG MUSIC STKS -
You must have been a beautiful baby. — M1630.18 .T63x 1985

3 Warren harry — SONG MUSIC STKS -
You must have been a beautiful baby. — M1630.18 .J64x

4 Warren harry — SONG MUSIC STKS -
You must have been a beautiful baby. — M1630.18 .B47x

ALL ITEMS HAVE BEEN DISPLAYED.
ENTER <LINE NUMBER(S),> TO DISPLAY FULL RECORDS
Q UIT FOR NEW SEARCH

APPENDIX G
EXAMPLE 7

```
WORKING...
-------------------------------------------------Songs Inde------------------
Composer:        Warren, Harry.
Title:           You must have been a beautiful baby.
Other Authors:   Mercer, Johnny.
First Line:      Does your mother realize, the stork delivered quite a
                   prize.
Collection:      Best songs of the 20's and 30's.

CALL #:M1630.18 .B47.          LIBRARY:SONG          MUSIC  STKS


---4 of 4-------------------------------------------Songs Inde------------------
 RETURN to continue, Q-UIT for a new search, or ^R  to REPEAT this display
^S  TO SELECT THIS RECORD:

LCCN:                 OCLC: 001898                    MODIFY MODE
-------------------------------------------------------------------------------
01 050:     `aM1630.18 .B47`
02 100:   10`awarren, Harry.`
03 245:   10`aYou must have been a beautiful baby.`
04 700:   10`aMercer, Johnny.`
05 740:   01`aDoes your mother realize, the stork delivered quite a prize.`
06 830:    0`aBest songs of the 20's and 30's.`
07 CALL NUMBER: M1630.18 .B47                  LIBRARY:   SONG  MUSIC  STKS
   REC TYPE: c      BIB LEVEL: m               FORMAT: SCORES
-------------------------------------------------------------------------------
^P> to PROCESS,  R> to REPEAT, or LINE# to edit   >
```

APPENDIX H
EXAMPLE 8

```
10/30/90
09:52 P.M.          SELECTED DATABASE:  Songs Index


This is an index of popular songs found in collections of songs
owned by the Music Library. Any song may be searched by composer,
librettist, title or first line.  The record will identify the
collection containing the song and the call number of the
collection.


            Enter   N   for  NAME search
                    W   for  WORD search
                    B   to   BROWSE by title, call number, or series
                    S   to   STOP or SWITCH to another database

            Type the letter for the kind of search you want,
            and end each line you type by pressing <RETURN>

                    SELECTED DATABASE:  Songs Index

ENTER  COMMAND (MAINT TO RETURN):>//WBEDPOST OVERNIGHT
 WORKING...
BEDPOST 00002 ITEMS
OVERNIGHT is in the data base, but did not occur with BEDPOST



PREPARING YOUR DISPLAY -- HOLD ON...
  1 Breuer ernest                                  SONG MUSIC  STKS    -
     Does the spearmint lose its flavor.           M1630.18 .683x 1985

  2 Breuer ernest                                  SONG MUSIC  STKS    -
     Does the spearmint lose its flavor.           M1630.18 .F5x

ALL ITEMS HAVE BEEN DISPLAYED.
ENTER .LINE NUMBER(S)> TO DISPLAY FULL RECORDS
 E >IT FOR NEW SEARCH
```

APPENDIX I
EXAMPLE 9

```
You began with a WORD search on:

BEDPOST OVERNIGHT
WORKING...
-------------------------------------------------Songs Index----------------
Composer:          Breuer, Ernest.
Title:             Does the spearmint lose its flavor.
Other Authors:     Rose, Billy.
                   Bloom, Marty.
First Line:        Does the spearmint lose its flavor on the bedpost over
                     night?
Collection:        Greatest legal fake book of all time.

CALL #:M1630.18 .G83x 1985     LIBRARY:SONG         MUSIC  STKS


---1 of 2-----------------------------------------Songs Index----------------
<RETURN> to continue, <Q>UIT for a new search, or <R> to REPEAT this display
<S> TO SELECT THIS RECORD:

LCCN:                OCLC: 005264                    MODIFY MODE
------------------------------------------------------------------------------
01 090:    ^aM1630.18 .G83x 1985^
02 100:  10^aBreuer, Ernest.^
03 245:  10^aDoes the spearmint lose its flavor.^
04 700:  10^aRose, Billy.^
05 700:  10^aBloom, Marty.^
06 740:  01^aDoes the spearmint lose its flavor on the bedpost over night?^
07 830:   0^aGreatest legal fake book of all time.^
08 CALL NUMBER: M1630.18 .G83x 1985          LIBRARY:   SONG  MUSIC  STKS
   REC TYPE: c      BIB LEVEL: m             FORMAT: SCORES
------------------------------------------------------------------------------
<P> to PROCESS, <R> to REPEAT, or LINE# to edit   >
```

APPENDIX J
EXAMPLE 10

```
11/06/90
07:02 P.M.        SELECTED DATABASE:  Performance Tape Index

The Performance Tape Index  provides access  to performances by the ASU
School of Music.  Included are recitals and concerts given by graduate
students,  faculty  and  large ensembles.  The tapes  are housed in the
Music Library.  These may be searched by performer, date of performance
[//C 1990/2-3  -  a browse by call number], medium of  performance
[trumpet, piano, or orchestra], and the music performed [you must use a
word search for composers in this database].


          Enter   N   for  NAME search
                  W   for  WORD search
                  B   to   BROWSE by title, call number, or series
                  S   to   STOP or SWITCH to another database

          Type the letter for the kind of search you want,
          and end each line you type by pressing <RETURN>

                SELECTED DATABASE:  Performance Tape Index

ENTER  COMMAND>>  //NCHAMBER ORCHESTRA
```

APPENDIX K
EXAMPLE 11

```
 WORKING...
Asu chamber orchestra      et. al.                          00005 ITEMS

PREPARING YOUR DISPLAY -- HOLD ON...
  1 Asu chamber orchestr                          PERF MUSIC  MUS     -
    [chamber orchestra concert]                   1989/10-24B

  2 Chamber orchestra                             PERF MUSIC  MUS     -
    [chamber music]                               1990/4-2A

  3 Chamber orchestra                             PERF MUSIC  MUS     -
    [chamber orchestra concert]                   1987/10-27

  4 Chamber orchestra                             PERF MUSIC  MUS     -
    [chamber orchestra concert]                   1988/10-25

  5 Chamber orchestra                             PERF MUSIC  MUS     -
    [chamber orchestra concert]                   1990/10-23A

ALL ITEMS HAVE BEEN DISPLAYED.
ENTER <LINE NUMBER(S)> TO DISPLAY FULL RECORDS
<Q>UIT FOR NEW SEARCH
```

APPENDIX L
EXAMPLE 12

```
LCCN:              OCLC: 00500159                    MODIFY MODE
-------------------------------------------------------------------------------
01 110:  20^aASU Chamber Orchestra.^
02 245:  11^a[Chamber orchestra concert]^
03 440:   0^aStudent recital series 1989^
04 505:  0 ^aConcerto grosso in G major, op. 6, no. 1 / G.F. Handel --
           Meditation on Christ lag in todesbanden / R. Cortez -- Concerto
           grosso no. 3 in F major / D. Scarlatti -- Nocturne for viola
           solo and string orchestra / R. LoPresti -- Concerto grosso for
           string orchestra and piano obbligato / E. Bloch.^
05 690:    ^aChamber orchestra.^
06 700:  10^aSpinosa, Frank.^
07 CALL NUMBER: 1989/10-24B                                  PERF  MUSIC  MUS
   REC TYPE: i      BIB LEVEL: m                 FORMAT: SOUND RECORDINGS
-------------------------------------------------------------------------------
<P> to PROCESS, <R> to REPEAT, or LINE# to edit   >
```

```
WORKING...
-------------------------------------------------Performance Tape Index-----
Musical group:    ASU Chamber Orchestra.
Title:            [Chamber orchestra concert]
Series:           Student recital series 1989
Contents:         Concerto grosso in G major, op. 6, no. 1 / G.F. Handel --
                    Meditation on Christ lag in todesbanden / R. Cortez --
                    Concerto grosso no. 3 in F major / D. Scarlatti -- Nocturne
                    for viola solo and string orchestra / R. LoPresti --
                    Concerto grosso for string orchestra and piano obbligato /
                    E. Bloch.
Medium:           Chamber orchestra.
Performer(s):     Spinosa, Frank.

CALL #:1989/10-24B            LIBRARY:PERF          MUSIC  MUS

---1 of 5-----------------------------------------Performance Tape Index------
 RETURN  to continue,  Q  QUIT for a new search, or  R  to REPEAT this display
```

LIBRARIANSHIP IN EL SALVADOR: THE NATIONAL COMPOSITE

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INTRODUCTION

The name El Salvador tends to bring to mind images of militarization, guerrilla warfare, and large amounts of U.S. tax dollars. Apart from these realities, there exist the various facets of daily life as the country continues to function as best it can. The people of El Salvador are coping with a decade of internal war in a most admirable fashion while the war's impact is felt directly and indirectly in every sector of society, including libraries. The broadest effects are the economic hardships brought about by the war. The sharpest effects are deaths and disappearances of people working in libraries and education, and of their family and friends.

Certain institutions and organizations are essential to the well-being of librarianship in any country. The national library, the library association, and the school of library science, among others, play critical roles in the development of information services. El Salvador can claim the existence of these institutions, as well as a growing number of university and special libraries. They function within the parameters allowed by a difficult political and economic reality as libraries and librarians in El Salvador struggle to offer uninterrupted service to their users.

This paper will offer a view of the fabric of librarianship in El Salvador and discuss some of its key elements. It will briefly describe the nature and condition of certain library institutions in El Salvador as seen during a visit to El Salvador in May 1990. At that time the author presented a workshop on AACR2 to the El Salvador Library Association (Asociación de Bibliotecas de El Salvador, ABES), as part of Librarians' Week (Semana Cultural del Bibliotecario). The trip was facilitated by the United States Information Agency (USIA).

THE EQUATION

The National Library

The National Library (Biblioteca Nacional) is currently housed in two nondescript buildings in downtown San Salvador because its permanent building was lost to earthquake damage. In addition, the land was lost because the government sold it to cover a social security debt. Twenty thousand of the collection's 70,000 volumes were lost in the earthquake and much of the collection is currently stored in boxes. One of the buildings presently occupied by the National Library has its reading room in the open-air patio. In spite of these logistical problems, the library continues to serve its users which are mostly junior and senior high school and university students.

For years, the National Library has had no materials budget and only acquires items through donations. The budget only provides enough personnel budget to employ a skeleton crew. For example, one person is employed to generate catalog cards one-by-one on a manual typewriter. The mimeograph machine previously used to reproduce cards was damaged in the earthquake.

The collection is organized into sections defined by the format and country of origin, including the Salvadoran Monograph Collection, the Foreign Monograph Collection, the Salvadoran Periodicals Collection, etc.

The National Library is wholeheartedly supported by the library community in El Salvador and those who work there are respected for their dedication in the face of depressing obstacles. During the AACR2 workshop, the group expressed its support for the National Library as the country's authority in cataloging practices. The director, Sonia de la Cruz de Luna, has applied for an OAS project grant along with other Latin American national libraries to begin automating the Library. She is also active in the new Association of National Libraries in Ibero-America (Asociación de Bibliotecas Nacionales de Iberoamérica, ABINIA), which promotes development of national libraries.

The National Archives

The National Archives (Archivo General de la Nación) is housed in the National Palace which is currently under reconstruction and partial restoration because of earthquake damage. For a year following the earthquake the Archives collections sat outside, exposed to the weather. In 1987, Joaquín Salaverría arrived to the post of director after spending a year at the Archive of the Indies in Seville, Spain. Prior to that, he had headed the History Department in one of the ministries in El Salvador. His degrees are from U.S. universities, including an M.A. in Anthropology. Mr. Salaverría holds this post as a choice, and not as a necessity. Coffee ranching is his family's business, and it has funded the purchase of supplies for the Archives at times. Mr. Salaverría supervises a staff of seventeen full-time employees and uses his training in Spain to organize the Archives. The United States Information Agency donated a ten-year-old micro-computer to the Archives, but since it has no hard-drive, UNESCO's software MICRO-ISIS can not be used.

The Archives are organized in twelve sections, including Law, Music, and Lands. Some of the materials sit on the floor because of the lack of bookshelves. Processing routines are being established, books are being organized on shelves, and documents packaged in brown paper and string are being opened and placed in archival, though not acid-free boxes. Newspapers are being microfilmed at the rate allowed by funds donated to rent the microfilming equipment. In May, one thousand copies were being made as the result of a doctoral student having paid for more copies than he needed for his work. Newspapers not filmed are pressed and bound together. None of the "archival" supplies are acid-free because no company in Central America manufactures them. Volunteers from high schools work in the afternoons, often doing very dirty work pulling packages of papers out of floor-to-ceiling stacks in the basements, dusting them, and placing them on shelves. San Salvador's semi-tropical climate is very destructive to these print materials which are not protected from the atmospheric conditions. Noticeable progress had been made in the six-month period from November 1989, when Steve Hoza from the Arizona Department of Libraries, Archives, and Public Records gave a conservation workshop, to May 1990, when the author visited.

The Library Association

The Library Association (Asociación de Bibliotecas de El Salvador, ABES) was formed in 1952 when Dr. Carlos Víctor Penna, UNESCO regional library consultant, visited El Salvador from his post in Havana to promote library cooperation among Latin American nations. Librarians from the National Library and the Central American University Library met and formed the association and outlined its goals as library improvement, founding of libraries, communicating with cultural organizations, the creation of a library school, and the publication of a national bibliography. The association organized several activities, including a workshop given by Dr. Eugene W. Moushey, a University of Wisconsin professor. In 1959, the first "Library Week" was organized with support from UNESCO and the OAS. The association exchanged newsletters with associations in other Latin American countries.

The sixties and seventies were years of sparse library activity. Then in 1985, the National Library rekindled interest by organizing a conference which was attended by sixty members of the library community. In recent years, the Library Association has collaborated with the Interamerican Association of Agricultural Librarians and Archivists (Asociación Interamericana de Bibliotecarios y Documentalistas Agrícolas, AIBDA) to organize the annual library events. This unity has provided a stronger foundation for librarians through the ABES' focus on national issues and AIBDA's focus on regional (Central American) issues.

This year the two associations planned a Librarians' Week (Semana Cultural del Bibliotecario) of tours, presentations and the AACR2 workshop. They brought in two presenters from other countries--one from the U.S. and one from Costa Rica, the region's leader in librarianship. The schedule for this year's conference was very full and attendance exceeded expectations by a wide margin. The AACR2 workshop was attended by sixty-five participants, more than twice as many as organizers had hoped for. The current president of the Library Association, Helen Guardado de Del Cid, is also director of the School of Library Science and a school librarian. In May, she was named Librarian of the Year. She is providing the library community with leadership and commitment that inspire members to participate in the association and to actively promote libraries in their country.

The relationship between libraries and the United States Information Service (USIS, overseas name for USIA) in El Salvador is optimal. Bernardo Melero, Regional Book Specialist with USIS has built strong ties with librarians over the past twenty-five years, and is viewed as an important member of the library community. His newsletter regularly reports library activities and he administers USIS' book distribution program fairly and effectively.

The School of Library Science

The School of Library Science (Escuela de Bibliotecología) at the University of El Salvador (Universidad de El Salvador, UES) is a three-and-one-half year program which ends in a thesis. It is an undergraduate level program that follows a high school education. The student carries four courses per semester, beginning with the organization of knowledge and history of libraries through archives management and library administration. In addition, the student takes four semesters of English, including library terminology in English. The program's description states that "El Salvador not only needs energy resources and balanced budgets for its social, political, and economic transformation, but it also needs the information found in scientific and technical literature." Personal qualities required by candidates include a dynamic personality, creativity, a spirit

of cooperation, and a professional ethic. The program description cautions that "People who are not book lovers and get no satisfaction from carrying out bibliographic services while expecting nothing in return, can not be librarians."

Due to a shortage of prepared instructors and funding, one generation of students completes the program before the beginning courses are offered again. The University of El Salvador was closed by the government in November because rebels had stored arms there. Consequently, classes meet in small groups in homes and restaurants. Professors now find themselves acting as guides and tutors for students who are forced to learn independently. Due to this closure, the School of Library Science has been inactive. Another consequence of the November offensive and the ensuing closure is the ineligibility of the University to receive any U.S. funding, including Fulbright scholars or lecturers.

The Central American University Library

Libraries in El Salvador are primarily affected indirectly by the war through economic hardships. But, the Central American University directly felt the war's impact when six Jesuit priests who worked at the university and two of their employees were murdered on November 16, 1989. On May 25, 1990, this university's library director dedicated Librarians' Week to them.

Mélida Arteaga, the library director at the José Simeón Cañas Central American University Library (Universidad Centroamericana José Simeón Cañas, UCA), wrote that "Libraries, books, and the teaching of reading are the best defense for freedom, solidarity, and understanding among human beings." These words set the tone for this library, which is the most sophisticated, best staffed and best equipped university library in El Salvador. The library began in 1966 when the university opened. Its first director, Raquel Flores, attended the University of Chicago and received the M.L.S. She was director of UCA's library until 1973. Presently she is director of the library at the Universidad Rafael Landívar in Guatemala.

The UCA library now has 85,000 volumes as well as maps, periodicals, and audiovisual equipment. Subjects include engineering, business administration, humanities, social sciences, and hard sciences. The library receives book donations from many European countries, as well as from the U.S., and it participates in international donation programs. The physical conditions of the library are monitored regularly and fumigation and conservation are routine procedures. There is a staff of eighteen, including four graduates from the El Salvador's School of Library Science. The collection is cataloged using the Library of Congress Classification System (since 1975) and AACR2. Automation entered the library in 1988 when the UNESCO software MINISIS was acquired. This system of bibliographic control has been developed by library school students as their thesis projects and now has a professional director. Currently it is the only automated system functioning in a Salvadoran university library.

CLOSING

Libraries in El Salvador continue to carry out their prime function of uniting information and literature with the user. Economic and political situations are daunting, but the library community shows resiliency and firmness of purpose as it brings to life on a daily basis the reasons libraries exist.

NOTES

1. "Universidad de El Salvador, Facultad de Ciencias y Humanidades, Departamento de Letras, Carrera de Bibliotecario." (Program description issued by the University, Oct. 88), 1.

2. Ibid., 4.

3. Arteaga, Mélida. "Reseña Histórica de la Biblioteca de la UCA en Sus 25 Años de Fundación." (Presented at the inauguration of the Semana Cultural del Bibliotecario, San Salvador, El Salvador, May 25, 1990), 1.

COLLECTION DEVELOPMENT AND COMPACT DISCS: ESTABLISHING SELECTION CRITERIA.

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INTRODUCTION

"CD-ROM Has Firmly Entrenched Itself with Librarians" - this is the eye-catching title of a recent article in *CD-ROM Librarian* (Nelson 1990). Indeed, as evidenced by the number of articles, conference papers, poster sessions, and even books on the subject, CD-ROM has had a definite, if sometimes troublesome, impact on the profession. In a look at the CD-ROM industry itself, Dr. Paul Nicholls of the University of Western Ontario and his co-author Ria Van Den Elshout give an excellent overview in their February 1990 article in *Database* (Nicholls 1990). They report that by the end of 1989 there were 496 unique, commercially available CD-ROM titles "fairly evenly distributed" among three general subject groupings: "humanities/general, social science and sci/tech". The greatest percentage (45%) of these CD-ROM products are categorized by Nicholls as source databases containing "full-text or numeric data, computer software, images or sound, ...maps and charts". Included in this category also are dictionary and encyclopedia databases. Thirty-one percent (31%) are the familiar index databases which provide bibliographic references and sometimes abstracts to the published literature. The last twenty-four percent (24%) are the reference databases - directories, catalogs of non-bibliographic items, and titles which combine index, source and directory content. Nicholls reports that the overall mean (or average) price of all types of CD-ROM products was $2239 in 1989. The mean price of index databases however, was $1577 - the lowest of the three categories - compared to $1957 for source databases and $3779 for reference databases.

Given the above information it quickly becomes evident that dealing with CD-ROMs in today's library requires a considerable amount of attention on the part of librarians. In this paper I would like to focus on the effort involved in the selection of CD-ROM index databases for an academic library. I will first provide a brief review of the professional literature. I will then describe the review process and the form used by reference librarians at the University of Arizona Science-Engineering Library.

REVIEW OF THE LITERATURE

CD-ROMs made their appearance in the marketplace in 1985. By mid-to-late 1987 articles began appearing in the professional literature focusing on issues of evaluating and selecting these products for library collections.

One of the first articles was by David C. Miller, a consultant in the area of CD-ROM library applications (Miller 1987). At the conclusion of his article is a "CD-ROM Evaluation Checklist". There are seventeen questions dealing largely with hardware and software considerations, vendor support and documentation. As the industry has matured and to some degree standardized, some of Miller's points may no longer be relevant.

Nonetheless they are useful, especially to "non-techies" or novices who don't know enough about the workings of hardware and software to ask the right questions.

In October 1987 an article was published in *American Libraries* by Linda Stewart of Cornell University's Mann Library (Stewart 1987). In this article Stewart lists guidelines developed at Cornell to "help library staff determine which compact-disc databases are more suitable for public use in their libraries." The guidelines are divided into five sections: collection development, administrative considerations, vendor considerations, search capabilities, and ease of use. The points covered are fairly specific in terms of features, functions, or services to look for in a product but, like those in Miller's article, are good reminders of things to be aware of when considering a CD-ROM title.

James Koga's article in *CD-ROM Librarian* in March 1989 focuses on software considerations with several cogent points made concerning security issues (Koga 1989).

The Librarian's CD-ROM Handbook by Norman Desmarais and published in 1989 by Meckler has a chapter devoted to selection. At the end of the chapter on hardware there is a checklist, adapted largely from Miller's 1987 article, dealing with hardware and software.

To bring us up to the current year, in fact to the most recent two months - a very relevant book was advertised on page 21 of the September issue of *CD-ROM Librarian*. It is titled *CD-ROM Collection Builder's Toolkit* by Dr. Paul Nicholls. Unfortunately I was not able to review because it has not yet been received at the UA Library. Nevertheless, the promotional information on the book says that the author presents "available CD-ROM evaluation and selection tools." It is an inexpensive ($29.95) and potentially useful book.

Finally, in the October 1990 *College & Research Libraries News*, John Haar and three colleagues at Virginia Commonwealth University present a "selection checklist for CD-ROM collection development" (Haar 1990). This checklist is composed of 40 questions addressing in detail: acquisition issues, coverage, software considerations, hardware considerations, vendor support and documentation, and service considerations. Haar reports that the list has been particularly helpful in conversations with vendors.

THE SELECTION PROCESS AT THE UNIVERSITY OF ARIZONA SCIENCE-ENGINEERING LIBRARY

The University of Arizona Library system has provided free end-user database searching to the UA campus community since 1984 when the CAS Online Service was established, followed in 1985 by the QuickSearch Service. CAS Online is the online version of *Chemical Abstracts* produced by the American Chemical Society and made available at greatly reduced rates through the Academic Program with the database vendor STN. QuickSearch is the name of the UA service through which students, faculty and staff can search a wide variety of online databases. The UA Library first used BRS After Dark as the vendor for QuickSearch but has since switched to Dialog's Classmate and Knowledge Index services. Seeing it as a logical step in provision of end-user search services, the library moved into the CD-ROM arena in 1988.

The Science-Engineering Library currently offers 5 CD-ROM index titles - AGRICOLA, MathSci, Medline, NTIS, and Selected Water Resources Abstracts (SWRA). In the spring of this year (1990) the reference staff began to consider which CD-ROM titles would be desirable for addition to the reference collection in the 1990-1991 fiscal year. In a series of meetings twelve CD-ROM indexes were identified for discussion. Individual librarians were assigned one or more of the titles for which to prepare a presentation. It

was proposed that after these presentations the staff would come to a consensus on the purchasing priority of the CD-ROM titles. It became apparent however, that for the presentations to be most useful there needed to be consistency in the information provided on each product. This led to the development of the "New CD-ROM Request Documentation" form (Appendix). This form is a single page, based to some degree on a form developed by the UA Library's New Serials Order Committee - a committee set up in recent years to monitor the acquisition of new serial titles with a very limited budget. The requestor using the "New CD-ROM" form is asked to identify the product, the vendor(s), coverage, update frequency, price, and software and hardware requirements. There is space given for a general description of the database and additionally a checklist of selection criteria to mark as appropriate. The requestor is given a few lines for "additional comments" and then is asked to rate the title under consideration as either high, medium, or low priority. The verso of the form is blank, allowing more space for additional information or comments. Many people attached vendor brochures to the form as well.

The Science Reference staff did find that although it is imperfect and could benefit from some modifications, use of the form facilitated gathering of information and subsequent group discussions. As mentioned above, it helped to insure some consistency in information provided. When all the presentations were made, the group was able to narrow the total number of titles under serious consideration to ten and then to prioritize them into three groups - high, medium, and low priority. This list was subsequently submitted to the UA Library's Collection Development Committee. After the total library budget was finally received, a budget cut crisis was survived, the information access portion of the budget was finalized, and CD-ROM equipment questions were resolved - then authorization was given for the orders to be placed! The Science-Engineering Library expects to receive the GEOREF, COMPENDEX, and BIOSIS compact disc databases (the high priority group) by the beginning of 1991.

To return, however, to the issue of selection criteria, let us look at those identified on the "New CD-ROM Request Documentation" form. (They are listed not in any particular order of importance.)

Print source difficult to use. (CD-ROM provides improved access). This was seen as an important consideration especially when there was the need to prioritize. An index that is time-consuming and/or difficult to use in print would be a more likely candidate for acquisition on CD-ROM than one that is quick and easy to use.

Provides possibility of cancellation of print source. This is something that initially not many librarians were comfortable considering, in spite of the fact that the Science-Engineering Library has cancelled the subscription to AGRICOLA's print counterpart, Bibliography of Agriculture, as well as portions of the subscription to Government Reports Announcements & Index (the print counterpart to NTIS). Recently however we have begun to take another look at this issue and have found ourselves more amenable to the concept.

Print and/or online source is in heavy demand. If the print version of a CD-ROM index is used frequently, especially if it is difficult to use (but even if it is relatively easy) this CD-ROM would get high consideration. Likewise, if an online version of a CD-ROM database was in high demand, either through the QuickSearch Service and/or through mediated searching, then that title also would get high consideration.

Not available on QuickSearch. Because the UA Library desires to offer as much end-user access to computerized bibliographic databases as is fiscally feasible, if a CD-ROM title was one which did not have an online version available through the QuickSearch Service and was important for other reasons, then it would get high consideration.

Other online source is very expensive. If a database was not available through QuickSearch and access by way of a mediated search was very expensive, a CD-ROM version of that database would be desirable, particularly if it was in heavy demand.

Fits in with collection development priorities. This has to do primarily with the subject area covered by the database and how that subject area is treated in the library's collection development policy. If the subject area covered by the database is one that fits into Library of Congress classes that receive high desired collection development code levels then that CD-ROM title would merit serious consideration.

Provides coverage of unrepresented subject area in our current CD-ROM collection. If a new title covered a subject area that was not covered by CD-ROMs already in place and it was important for other reasons, then it would also be of high interest.

The above criteria are specific to the needs of a particular library. None of them alone can make or break the decision to acquire a CD-ROM database. In our discussions and deliberations it was always a combination of factors that led to the group's consensus on the relative value of a particular title.

CONCLUSION

In conclusion, it is useful to have established objective criteria when evaluating and selecting any information format. It is especially important, however, to have criteria when evaluating titles in a format such CD-ROM which is still relatively new. The documentation form developed at the University of Arizona Science-Engineering probably has conciseness or brevity as its chief value. It is a starting point for discussions. The guidelines and checklists in the papers reviewed above provide valuable suggestions for getting the detailed information important in making an educated selection decision.

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APPENDIX

New CD-ROM Request Documentation

Requestor's name:_____Dept.:_____Phone:_____

Complete title of CD-ROM product:_____
Vendor(s):_____
Years covered:_____Update freqcy:_____
Price:_____
_____
_____
Software & hardware requirements:_____
_____
_____
_____
Description (subjects, bibliographic vs. full-text, etc.):_____
_____
_____
_____
_____
_____

SEL Selection Criteria (Check those which are relevant.):

__ Print source difficult to use. (CD-ROM provides improved access.)
__ Provides possibility of cancellation of print source.
__ Print and/or online source is in heavy demand.
__ Not available on QuickSearch.
__ Fits in with collection development priorities.
__ Provides coverage of unrepresented subject area in our current CD-ROM collection.

Additional comments:_____
_____
_____
_____
_____

I would rate this title (circle one):

HIGH PRIORITY MIDDLE PRIORITY LOW PRIORITY

UNION LISTS OF SERIALS--AN OLD IDEA WITH A NEW APPLICATION IN MODERN RESOURCE SHARING

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Union lists of serials have been with us for many years. In the United States the first published serials list, *Check List of Periodicals*, was produced in 1876 by Johns Hopkins University. In 1927 the *Union List of Serials in the United States and Canada* appeared with the third edition (1966) containing the serials holdings of 956 libraries representing 156,499 titles. Originally this list and others were used as internal tools to indicate the holdings of a particular library. It is only with the development of modern technology that union lists of serials have become a part of resource sharing. The use of modern union lists can result in improved interlibrary loan, reciprocal borrowing and resource sharing capabilities, reduced need to subscribe to seldom-used titles, serials selection and deselection, improved serials control, and cooperative serials acquisitions. To achieve good results there are two components of the union list that must be accurately reported: 1) correct information about the title itself, and 2) specific and up-to-date information on volumes and/or years held by the library.

Over the years, librarians have experienced numerous changes in technical procedures which have affected the use of union lists. The 20th century witnessed an accelerated growth and development unprecedented in human history. The rapid growth of library borrowing and lending during this time had a significant impact on libraries. Suddenly the old paper lists were being used in ways undreamed of by librarians a few decades earlier. Libraries would duplicate their list and exchange it with other libraries near them; they would then be able to check the holdings of a few nearby libraries before sending a patron to another location. However, the paper union lists of serials were criticized as being out-of-date almost before they were produced. Librarians began to cast about for ways to bring union lists of serials into the 20th century. The idea of union listing was sound, but modern technology needed to be brought into play for improved service to patrons. With computerization the speed with which union list information can be shared has increased dramatically. In the last decade we have seen more and more online union lists that provide continuous access to union list data. The computer has facilitated the online availability of serial files, the identification of holding libraries, and the capability for online interlibrary loan functions.

The impact of automation on union list creation cannot be underestimated. If the information resides in a computerized database, it can be used and manipulated many times over by many different libraries. We can now change our minds with relative ease. There have also been dramatic changes in the ways union lists are compiled and produced. Adding, modifying or deleting union list information was cumbersome in the days of the paper list. Any changes to the data would result in having to redo the list completely. To say these limitations discouraged participants from producing new editions of their lists is an understatement. Often years would elapse between new editions. Once produced, a list was considered a finished product, not a dynamic and changing entity.

Advances made in computer technology have opened the door for libraries to cooperate in sharing bibliographic data. The flexibility of computer technology and storage is reflected in the off-line products. For instance, OCLC union list groups can select which fields of the bibliographic record they want displayed in their lists. They can easily change their minds with each new edition of the list, adding more fields when desired or deleting ones that prove superfluous. Holdings data can also be manipulated for ease in tracking and updating the information. The development of computer systems that could support large numbers of terminals and allow users to share access to databases is very important. The technology is in place to facilitate the use of computers to access bibliographic databases, search for specific information, and download that information to a local printer.

Use of union lists of serials by Arizona libraries has been influenced by the same technological developments as other libraries throughout the U.S. The exchange of in-house paper union lists of serials was common, even after the beginning in 1984 of the Arizona union list of SOLAR (Serials OnLine in Arizona). Over the years SOLAR members began to rely more and more on the SOLAR list as the database improved and became larger. Arizona libraries have gone from searching outdated paper lists to using the SOLAR microfiche, and from there to searching SOLAR online for the most up-to-date information. With the development of SOLAR in the Union List Sub-system of OCLC, Arizona has taken the next step in technology that has been so prevalent in the '80's. Computerization of a union list is helpful and quick for compilation and updating, but it is the advent of telecommunication networks that have truly brought union lists of serials into the resource sharing limelight.

Successful cooperation within a telecommunication network is directly related to a willingness on the part of libraries to conform to library standards. A library has more choices now than ever before, from stand-alone products or isolated self-contained systems to an interactive networked system. Although the immediate patron community is the focus of most libraries, today's librarians realize that their patron community is as large as their network. Networks enable librarians, faced with clients' information needs beyond their local resources, to identify and obtain materials and services for those clients.

Resource sharing has not developed in a vacuum. There are many outside factors that greatly affect libraries and union listing. The mobility of our society has always given the United States a unique character. The '80's and '90's have seen and will continue to see a movement of population to the southwest. This has brought many people into Arizona from areas of the United States that have had long established resource sharing networks. These patrons expect the same service wherever they go, and, as technology develops and the public becomes more accustomed to the quick gratification of their information needs, they become more demanding.

Phoenix itself has changed rapidly, from a city of 439,170 in 1960 and 955,695 in 1988, to one of the fastest growing cities in the nation. This trend will continue into the twenty first century. Businesses that relocate expect good information services, and to hire employees educated at the colleges and universities in the area. This is another factor which encourages resource sharing—better education supporting economic development. As Phoenix has grown, another movement has developed—the movement of city people to the smaller outlying towns. Again, the patrons take their information expectations with them and smaller libraries are challenged to provide these patrons information of the same level as the large metropolitan libraries

One of the major outside factors to affect libraries and union listing is library funding. In today's economic climate, cutbacks are a way of life in libraries; staff are expected to do more with less. As the patrons' expectations rise, the money to help fulfill those expectations drops. Streamlining tasks becomes essential. Union lists of serials are the only library tool whose creation is based on a negative assumption. This assumption (that the day will come when a library lacks a particular issue of a title and will want to borrow it) has been reinforced during the past decade. The number of available serials have proliferated and the cost has escalated. Library budgets have dwindled dramatically. The buying power of the '60's and '70's no longer exists. The combination of these factors has set a political climate sympathetic to resource sharing. The reality of the situation is that a library cannot afford subscriptions to all desired titles and this has set the stage for cooperative library ventures including the compilation of union lists of serials.

Taking advantage of technology saves a library time and manpower. Sharing resources saves on serial subscriptions and allows money to be spent on other essential items. Cutbacks in libraries affect quality of education which affects economic development. Participation in an online union list of serials is a small part of the streamlining process, but very important in light of increasing serial costs vs. patron demand.

Within the library community, the time seems right to develop resource sharing further in the form of union lists of serials. No library can stand alone anymore. Technology makes electronic information retrieval and delivery an everyday occurrence. Today's union lists of serials are invaluable for interlibrary loan purposes where determining ownership of a serials title quickly and accurately is essential. Libraries can also use union lists as collection development tools. This can be done in two different ways. Participating libraries may decide to divide subject responsibilities among themselves. They may also create a method of shared collection development that would function around a library's decision to weed a title from its collection.

The growing number of serials titles and the high cost of currently published titles has set the stage for libraries to depend on one another more heavily for the serials they lack. There has been a marked increase in numbers of union lists of serials of the last decade. While the new technologies have permitted greater ease, speed, and flexibility in creating these lists, it is doubtful that librarians would be so eager to participate in union listing activities if the need for resource sharing did not exist. Due to financial constraints on library budgets, union lists of serials have received a great deal of attention as a vehicle for resource sharing. Most libraries will find themselves using their union list as the basis or core for developing a regional or statewide resource sharing network.

SOLAR was developed from an identified need in Arizona for shared serials holdings information. Originally created in the Union List Sub-system of OCLC for quick location of a title, SOLAR is now in place as a core for the development of a statewide bibliographic database to be used in resource sharing.

In order to make a union list work, commitment and a strong sense of cooperation is essential, as well as a raised level of political consciousness. New technologies have permitted us more speed and flexibility in the ways in which union lists are compiled. At the same time, economic conditions have been such that independent libraries have felt a greater need to engage in resource sharing activities. The result has been a marked increase in the number of union lists in existence.

Although we have witnessed many changes in union list compilation, the basic concepts of resource sharing have remained the same. As with all library services, those who create and participate in union list activities have benefited from the new technologies

that permit us to respond more quickly and efficiently to our users' needs. Unquestionably library technology will continue to develop in the next decade. Union lists will contain not only serials, but all other forms of bibliographic records. Union lists of serials were an important factor in this trend, and the old idea of compiling a library's serials holdings and then providing it in an efficient and timely manner has been expanded to encompass possibly the entire holdings of each participant. Libraries are now utilizing much more of the available technology to develop resource sharing based on some of the old ideas behind union lists of serials.

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