INDIANA LIBRARIES

A Quarterly Journal

Winter 1981
Volume 1
Number 4

INDIANA LIBRARIES
ISSN 0275-777X

INDIANA LIBRARIES is the official quarterly journal of the
Indiana Library Association
Indiana Library Trustee Association
Indiana State Library

Jill P. May, Editor
Mona F. Slaton, Assistant Editor/Managing Editor
Elbert L. Watson, Advertising Manager
Pamela J. Bennett, Special Consultant

INDIANA LIBRARIES is issued quarterly in Spring, Summer, Fall and Winter. Subscription price, $10.00 annually. Advertising and subscription offices: Indiana Library Association, 1100 W. 42nd St., Indianapolis, IN 46208, (317) 923-2197. Address articles for publication to Jill P. May, Editor, INDIANA LIBRARIES, 118 Matthews Hall, Purdue University, West Lafayette, IN 47907.

Nancy E. Zoller, Composer Typist
Indiana Historical Bureau Print Shop, Printers

Cover design: M. F. Slaton

Postage Paid at Indianapolis, Indiana

INDIANA LIBRARIES

A Quarterly Journal

Winter 1981
Volume 1
Number 4

CONTENTS

EDITORIAL

Automation is certainly no stranger to Indiana libraries. As early as 1962 Purdue University was designing an automated serials control system. The Indiana Union List of Serials, first published in 1972 was one of the earliest union lists in the country. The Indiana Cooperative Library Services (INCOLSA) has been a model for statewide automation coordination and on-line cataloging support. Several people having national recognition in the area of library automation have had a "Hoosier Connection." Don Hammer, Executive Secretary of LITA, the Library and Information Technology Division of the American Library Association was the first Head of Systems Development at Purdue University. Miriam Drake, Assistant Director of Libraries at Purdue is Chairman of the Board of Trustees at OCLC, Inc. Barbara Markuson, Executive Director at INCOLSA, has been a national authority on automation and networking and was instrumental in developing automation at the Library of Congress.

This is somewhat remarkable considering Indiana is primarily an agricultural state with few large cities and few large libraries. Only six cities have a population over 100,000. Only fifteen libraries have collections in excess of 300,000 volumes. In fact James Rush noted in his report on Indiana libraries that half of the population of the state is served by libraries with collections averaging less than 75,000 volumes.

In spite of this, nearly ninety libraries are currently doing on-line input of cataloging data through OCLC. A number of Indiana libraries have installed or are planning to install on-line turnkey circulation systems. Numerous automation projects are underway in university libraries in the state with some crystal ball gazing into the possibilities of joint development of an integrated library system.

Debora Shaw, better known in these parts as "Ralf," gives a good overview of library automation in general with some special attention to the "Hoosier Connection."

The Indiana State Library, in a key position both geographically and politically, has taken an active role in automation efforts within the state. While they are well on their way in planning a major system they also offer several automated services. Ed Stockey, Head of the Data Services Division describes one of those services in this issue.

Indiana has a number of corporate and special libraries. Often these libraries require record structures and services that differ from traditional library practices. JoAnn Brooks and Leota Boeson of Vocational Education Services at Indiana University, Bloomington describe such a system. A feature of particular interest is the successful use of a general data base management system in a library information center environment.

This only scratches the surface of automation in Indiana. The professional library organizations within the state all have strong automation divisions. Each of them sponsor at least one meeting per year at which progress reports are given and a forum for idea exchange is provided. The Indiana Library Association has a division called Library Automation and Technology. It sponsors programs at the annual ILA meeting and cosponsors workshops during the year. The American Society for Information Science (ASIS) has an Indiana Chapter that sponsors regular programs and workshops, most of which are automation oriented. The Special Library Association has a Technology Division. The Indiana SLA Chapter often jointly sponsors automation related workshops within the state.

Lawrence A. Woods
Guest Editor

Library Automation: A Brief Review, With a Hoosier Slant

Debora Shaw

Introduction

Not long ago any librarian contemplating a library automation project was advised to sit quietly and let the urge pass. Today library users, boards of directors, library staff members, and fellow librarians are likely instead to wonder why more is not being done to automate library operations. Computer technology has become part of our lives, affecting everything from utility bills and banking to the games we play. It is small wonder that we look to these machines for solutions to so many of the problems libraries face.

Many of the initial problems with library automation stemmed from a failure to appreciate the special needs of libraries. Early work with computers (in the 1950's and early 1960's) emphasized solving mathematical equations, then expanded to include business applications. Clearly library operations seldom require the mathematical capabilities (sometimes called "number crunching") needed for scientific research. (For example, one does not often wish to calculate the square root of the average Dewey Decimal number.) It

---

Debora Shaw received a BA in the History of Ideas at the University of Michigan and subsequently an MALS at the same university. She worked at INCOLSA as network librarian and at Indiana University as Project Manager of the Online Union List of Serials Project. She's presently a doctoral student and visiting lecturer at the IU School of Library and Information Science in Bloomington.

was not equally clear, however, that many library operations are also quite different from business functions. As Richard Boss points out, libraries use much larger files of information, which are consulted less frequently than the typical business inventory files.[1]

Moreover, librarians have developed complex rules and tools for handling a wide variety of information-bearing materials. All too often we overlook the major contributions to information storage and retrieval of classification schemes, vocabulary control devices (such as subject heading lists), indexes and bibliographies. Rather than using computers "because everyone else does" the aid of automation efforts should be to improve libraries' basic information function by taking advantage of the computer's capacity to reduce the manual effort or cost of operations, or to increase their speed and accuracy.

Early Uses of Computers

Computer technology based on transistors rather than vacuum tubes emerged in the late 1950's. Librarians with access to these expensive but relatively reliable machines were most often in special libraries serving private businesses.[2] They used computers, for example, to do selective dissemination of information (SDI), alerting library users to new items in their fields of interest. Other early uses of computers in library work include production of key word in context (KWIC) and key word out of context (KWOC) indexes, and computer produced book catalogs.

While these techniques provided results less visually elegant than manually prepared information sources, automated SDI, indexing, and lists were sufficiently quick and inexpensive to be used where no such service had previously been possible. From the beginning, then, computers have been used not only to improve existing operations but also to provide additional services. As libraries have "a vast reservoir of unmet needs," this capability to expand services through automation is certainly a welcome development.[3]

Automation Projects

Pioneers in library automation hoped to go beyond automating single functions, to develop total automated library systems. Early work on such ambitious schemes included projects at Florida Atlantic University and the Information Transfer Experiment (INTREX) at

the Massachusetts Institute of Technology.[4, 5] Unfortunately the computer technology then available could not support the hopes and plans many had for these projects. However, they provided important opportunities to review what libraries do, and to begin to consider how operations might be improved using the new technologies.

Other important contribuitons to the library automation field came from the Library of Congress. The 1963 report *Automation and the Library of Congress* outlines both short and long range benefits of library automation, and recommends that the Library undertake an automation effort beginning with internal processes.[6]

The next major development was the machine-readable cataloging (MARC) format for describing cataloging information so that it could be handled by computers.[7] The need to express all the possible complexities of what had formerly been done only by people in preparing catalog cards demonstrates again the sophisticated, complex rules librarians have developed to organize the elusive and various pieces of information with which we work.

Data Base Development

Development of the MARC format for books, followed by formats for bibliographic descriptions of other materials, allowed the Library of Congress to use computers in printing catalog cards. Other organizations were also using computers to speed creation of printed information retrieval tools. For example, *Chemical Abstracts and Psychological Abstracts* were reproduced more efficiently using computers, and the Educational Resources Informaton Center was able to publish both *Current Index to Journals in Education and Resources in Education* with computer technology.

The availability of these relatively large files of bibliographic information made possible further uses of computers by libraries. In Indiana MARC tapes were used at Indiana University for an SDI project, and at Indiana State University as the basis for acquisitions and cataloging records. Academic libraries across the state purchased data bases from sources including Chemical Abstracts Service, Educational Resources Information Center, and Engineering Index to provide sophisticated searching capabilities and produce bibliographies for researchers.

Hoosiers also created data bases. One experiment in public library SDI done through the Crawfordsville Book Processing Center demonstrated that these "new fangled" developments need not be restricted to special or academic libraries.[8] Another major cooperative effort was the Indiana Union List of Serials, produced at

Purdue University, which listed serial holdings from over 60 Indiana Libraries.[9]

Networking

Increased computing power and the telecommunications (telephone) support, allowing geographically dispersed libraries to use a central computer encouraged increased cooperation among libraries. This cooperation, termed "networking," developed rapidly in the late 1960's and early 1970's. The best known network of the day was the Ohio College Library Center, a group of libraries using a central computer to produce catalog cards from the MARC tapes and from data they entered themselves.

The basic function of this network, computer support for cataloging, has since been assumed by a new entity, the Online Computer Library Center, which is sometimes referred to as a bibliographic utility. The new OCLC provides much more than cataloging support; OCLC's computers are also available for acquisitions, interlibrary loan, and serials control operations (including union lists of serials production). Other bibliographic utilities have also developed, notably the Research Library Group's Research Libraries Information Network (RLIN), the Washington Library Network (WLN) and the University of Toronto Library Automation System (UTLAS).

Regional networks providing access to bibliographic utilities and support for library cooperation on a state-wide or multistate basis are an important part of the networking scene. In Indiana the Indiana Cooperative Library Services Authority (INCOLSA) is involved in projects ranging from the creation of an Indiana data base using OCLC to education and planning for on-line information retrieval and automated circulation capabilities. On a more local level the area library services authorities (ALSA's) encourage cooperation among libraries on a multi-county basis.

Barbara Markuson, commenting on the importance of library networks and bibliographic utilities in library automation, points out the relatively small "research and development tax" which each library pays for use of the service.[10] Pooled together, these funds make possible impressive library automation developments which would be beyond the means of all but the wealthiest libraries without cooperation. In Indiana the state legislature has recognized and supported library cooperation by funding part of the cost of the ALSA's and INCOLSA.

Information Retrieval

Automation of information retrieval for library users has also mushroomed as a result of data base development and advances in technology and communication. Nearly 1000 data bases containing citations or numeric data may be searched using the computers of 170 commercial search service vendors.[11] Of these vendors, BRS, DIALOG, and SDC are the most prominient in the library market. They provide computers and programs to search data bases as varied as *Magazine Index*, *Excerpta Medica, and Pollution Abstracts.*

Searching these files is much faster than looking through bound volumes of several years' printed indexes. In addition, the computer is able to scan every word in each citation. As citations frequently include abstracts of the articles, searchers can use terms from the abstracts and titles as well as the indexer assigned terms in retrieving citations.

Mini And Micro Computers

Another advance in computer technology led to further increases in computer capabilities and decreases in cost. Minicomputers arrived in the mid-1970's, and have proved to be a valuable part of many library automation undertakings. A "mini" allows a library to have a "stand alone" operation, with the relatively inexpensive computer in the library and no need to rely on an outside computer center or network.

Many libraries have developed their own programs for a variety of operations using minicomputers.[12] For those who prefer letting someone else do the development, several companies sell minicomputer based library systems. These care called "turnkey" systems, as the seller provides the equipment, the programming, and sometimes also the maintenance of the hardware and/or the programs—the library need only turn the key and drive off into the sunset. Several turnkey minicomputer systems, such as CLSA and DataPhase, began as circulation systems. They have since expanded to include at least a rudimentary public catalog capability, and some libraries have used minicomputers to support local networks.

Microcomputers represent an even more recent technological development and their uses in libraries are only beginning to be explored. Larry Woods indicated the remarkable advance in computer technology microcomputers represent—he used to remind computer system users that the display device in the library was a *terminal* attached to a big computer; it was not the computer itself.

With a microcomputer, the entire computer can fit easily on a desk, and the distinction between central computer and peripheral terminal becomes blurred.[1 3]

Microcomputers allow even more distribution of computing power and responsibility to various points in a network. This means more local control or manipulation of information is possible. However, the reliance on large files of data for library functions means microcomputers alone cannot meet all library automation needs.

Conclusion

The field of library automation has seen rapid changes, resulting both from improved understanding of libraries and from technological advances. We have available a wide range of tools, and are embarking on the political decision making required to help fit together the pieces to provide the best possible library services, using technology where appropriate. Responsible librarians can no longer sit and watch automation pass by. We need as much concern, involvement, and understanding as each of us can contribute to build on the progress we have made and to provide improved services to library users.

Notes

[1] Boss, Richard W. *The Library Manager's Guide to Automation*. White Plains, N. Y.: Knowledge Industry Publications, 1979.

[2] Observations regarding parallels between computer developments and library automation were made in a lecture to Indiana University Graduate Library School students in Introduction to Information Science by Charles H. Davis, February 21, 1980.

[3] Atkinson, Hugh C. "Personnel Savings through Computerized Library Systems," *Library Trends*, 23 (4) 587-594, April 1975.

[4] Heiliger, Edward M. "Florida Atlantic University Library." In Frances B. Jenkins, ed. *Proceedings of the 1965 Clinic on Library Applications of Data Processing*. Champaign, Ill.: University of Illinois, 1966, 92-111.

[5] Overhage, Carl F. J. and R. Joyce Harmon, eds. *INTREX: Report of a Planning Conference on Information Transfer Experiments*. Cambridge, Mass.: M.I.T. Press, 1965.

[6] King, Gilbert W. et al. *Automation and the Library of Congress*. Washington, D. C.: Library of Congress, 1963.

[7] Avram, Henriette D. *MARC, Its History and Implications*. Washington, D. C.: Library of Congress, 1975.

[8] Davis, Charles H. and Peter Hiatt. "SDI Is for People," *Library Journal*, 96 (9) 3573-3575, November 1, 1971.

[9] Corya, William L. Gary L. Lelvis, and Bonnie A. Siiss. "Indiana Union List of Serials Project," *Library Occurrent*, 24 (11) 455-462, 470, August 1974.

[10] Markuson, Barbara Evans. "Cooperation and Library Network Development," *College and Research Libraries*, 40 (2) 125-135, March 1979.

[11] *Directory of Online Databases*. Santa Monica, Calif.: Cuadra Associates, Fall, 1981.

[12] Grosch, Audrey N. *Minicomputers in Libraries, 1981-1982*. White Plains, N. Y.: Knowledge Industry Publications, 1981.

[13] Woods, Lawrence A. "Workshop on Microcomputers in Libraries," ASIS 9th Mid-Year Meeting. Pittsburgh, May 14-17, 1980.

Indiana Library Statistics Project: A Report

Edward A. Stockey

Background

The Library Statistics Project, a joint effort of the Extension and Data Services Divisions of the Indiana State Library has two primary goals:

1. Reduce the costs involved in producing the *Annual Library Statistics Report.*
2. Provide improved analysis of the data which is being collected.

In achieving these goals it was realized that two separate but related tasks would have to be accomplished.

1. Generate the *Annual Report* from the data input.
2. Create a data base from which customized analyses and reports could be produced.

Because the project would require computer programs on a continuing basis, it was decided that rather than employ or contract for programming, a statistical applications package would be utilized.

Edward A. Stockey is Head of the Data Services Division at the Indiana State Library. He received a BA in Psychology from Indiana University, and did advanced studies in Classical Archeology at the University of Pennsylvania. He received his MLS from Drexel University. Prior to working at the State Library, he was manager of INCOLSA's Regional Processing Center.

Basically, a statistical analysis applications package is a set of computer programs which can be used by a non-programmer to analyze data, generate reports, etc., without the necessity of writing instructions in a higher level computer language such as FORTRAN, PL1, etc. Typically, once data has been input into the computer, very brief one or two line instructions will generate analyses and/or reports that might normally require hundreds or even thousands of programming instructions. For the Library Statistics Project, the Statistical Analysis System (SAS) applications package, available on the state's computers, was chosen.

SAS is very flexible, simple to use, and provides the following capabilities:

* retrieval
* transformations
* manipulations
* maintenance
* report writing
* printer graphics
* data reduction and summarization
* statistical analysis

SAS consists of a data-handling language and a library of procedures that work together as a system as is shown in Figure 1.[1]

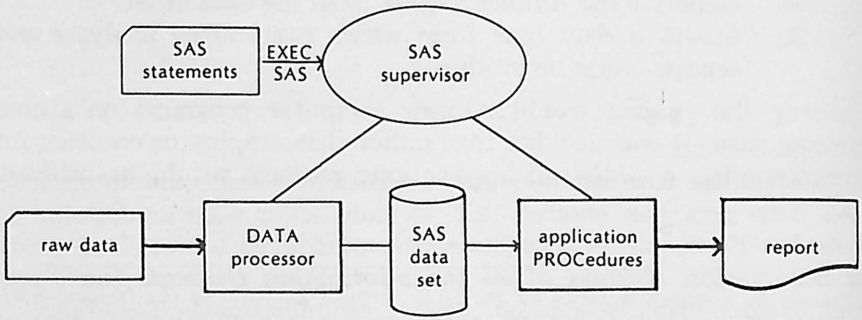

Figure 1

Using SAS, the Project consisted of three steps:

* Data input
* Creation of a library statistics data base
* Report production

Data Input

Individual public library data for the year 1980 was keyed onto magnetic diskettes from each library's Annual Report Form. Individual library data for 1979, already in magnetic form (tape) was also input into the computer. Finally, summary statewide public library statistics for the years 1970-78 was keyed onto diskettes and input. Initial analysis of the 1980 data indicated several discrepancies and errors. Therefore, a Data Correction Form was produced. Basically, the Data Correction Form was a printout of a library's data as it was initially reported and input into the system. Libraries were asked to verify and/or correct the data and return it to the State Library. Upon receipt, the corrections were made to the original data. The philosophy behind the data input phase of the project was that the individual library is responsible for ensuring that the information submitted to the State Library is correct and accurate. The State Library, however, assumes responsibility for verifying that the data is correctly input into the computer and reported.

Data Base Creation

After the data has been input, a SAS data base containing three SAS data sets was created. A SAS data set is a sequential file of records with the same variables represented in each record. A record or observation consists of all the information elements (variables) such as circulation, telephone number, etc., for a particular library or in the case of statewide summary data - year. The data base creation process is shown in Figure 2.

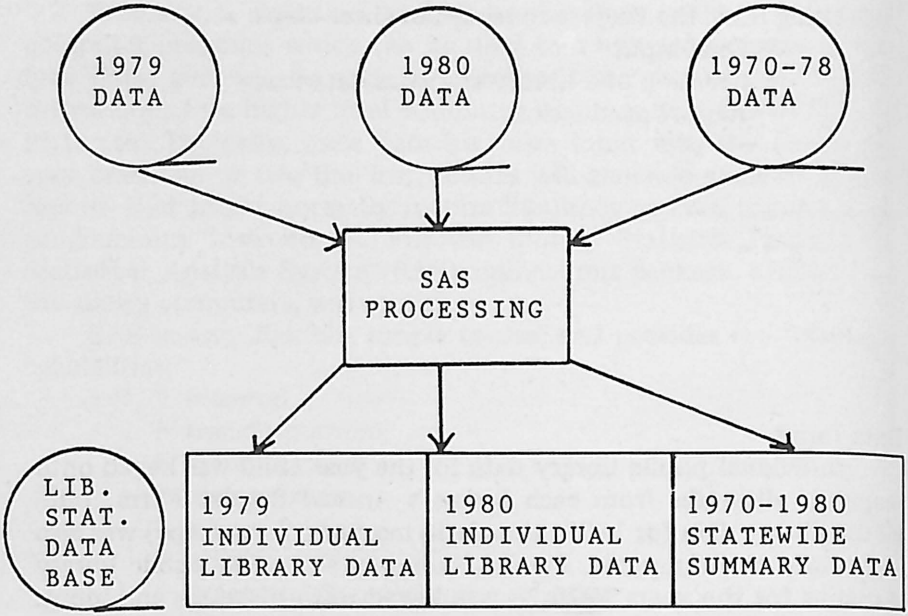

Figure 2

Report Production

Using the Library Statistics Data base, a computer print tape was produced. This tape was forwarded to a computer service bureau which utilized a Xerox 9700 non-impact printer (laser) to print the *Statistics of Indiana Libraries - 1980*. For 1981, the report forms themselves, as well as the Annual Report will be computer-generated. In addition to the Annual Report, a customized, individual report will be produced to assist libraries in their budget preparation efforts.

Conclusion

The use of a statistical analysis applications package, SAS, has provided a very efficient and cost effective method for the creation of a library data management and reporting system. As with all projects involving statistical anlaysis, manual and automated, the major problems involve data integrity and comparability. The State Library has created a statistics committee to assist in simplifying and standardizing data collection as well as specifying the types of analyses and/or reports that would be most helpful to a library's decision making process.

Notes

[1] SAS Institute, *SAS VIEWS*, Cary, North Carolina: SAS Institute, 1-2.

Vocational Education Services:

A Microcosm of the Zeitgeist

JoAnn Brooks
Leota Sigrid Boesen

The library of Vocational Education Services (VES) was conceived and developed in the midst of an international problem and a national trend: the information explosion and the advent of specific computer applications in libraries. Even though most of the professional literature written from 1965 to 1980 heralds the positive correlation between burgeoning information and the use of computer technology to gain bibliographic control over it, few articles have described operational systems[1] that have been successful in bridging this gap. Rather, most of the literary output has focused either on an

---

JoAnn Brooks has been Information Specialist/Visiting Associate Librarian at Vocational Educational Services since 1977. Before that time she was Visiting Assistant Librarian at the Institute for Sex Research Library. She has a BA in English and a MLS and Specialist Degree in Library and Information Science.

Leota Sigrid Boesen holds a dual Visiting Affiliate Librarian appointment as Assistant Information Specialist at Vocational Education Services and as Reference Librarian for Interlibrary Services at the Indiana University Libraries. She received her undergraduate degree in Music from Smith College and the MLS in Music Librarianship from Indiana University.

acknowledgment of the information problem and esoteric solutions to it, or on regional, national, and international networking and cooperation as a means to control the printed word. These types of publications are useful for gaining a general overview of current trends in the field, but there is a need for "publications concerned with the question of why particular projects are undertaken. . .and what genuine success has occurred."[2] In other words, there is an urgent demand for a microscopic examination of a system that has met the specialized needs of its collection, clientele, and curators. The following discussion of Vocational Education Services and its automated processes attempts to provide such a view.

Vocational Educational Services

Vocational Education Services began in 1972 as a small project funded to the Department of Vocational Education at Indiana University to produce a newsletter alerting vocational educators to exemplary projects in Indiana. As information needs of state vocational educators grew, the project gradually expanded. In 1976 it began a publication service to edit and condense selected final reports of state-funded projects, program and project abstracts, and position papers. The following year the funding agency, the Indiana State Board of Vocational and Technical Education (SBVTE), decided that in addition to a publications service, Indiana needed a project which could acquire, organize, retrieve, and store research and development documents and final reports which had been collecting in the SBVTE office. The funding agency also wanted access to national data bases and information sources.

When the information service component of VES began in 1977, there were three primary objectives. They were: (1) to conduct a user needs study for the information service, (2) to develop a flexible, multifunctional plan to implement the information service, and (3) to catalog and store reports and products currently available, which were produced in or received by the state. With invaluable input from an advisory committee of Indiana University librarians, the user needs study and the development plan were completed during the fiscal year.[3] The plan covered all aspects of operating the information service from setting selection policy to retrieval from commercial data bases.

The opportunity to develop a new library does not occur often and few librarians are granted the challenges and the struggles of

doing so. There are numerous decisions to be made such as what cataloging and classification system to use, how to maintain the system, and what sort of access to documents is needed. These decisions can only be made in relationship to the purpose and location of the library, the clientele to be served, and of course, the budget.

At VES, located at Indiana University, the decision was quickly made that the data base created must be machine readable and that cataloging and indexing should conform as much as possible to the national education data base: Educational Resources Information Center (ERIC). The purchase of computer hardware or software was not a budgetary possibility; and, therefore, the hardward and software already available at Indiana University had to be adopted or adapted. This article describes the reasons for these decisions and how the resultant processes were implemented at VES.

Technical Processing

The standard factors considered in planning the organization of any type of library collection are the various media in its holdings, the bibliographic format desired, the methods of using the bibliographic information, and the physical processing of each document. Even though the methods for handling these classical tasks never change, the means for handling these processes do. Most research and college libraries are committed to traditional document handling guidelines set forth in the *Anglo-American Cataloging Rules* (AACR) and the Library of Congress' (LC) classification schemes due to the general nature, size, and longevity of their collections. However, special libraries, like Vocational Education Services, which have just started their collections can "provide a micro-testing ground for new and innovative nontraditional approaches"[4] to library technical services.

The specialized nature of the documents in the VES collection necessitated a different bibliographic control system than was offered by traditional classification schemes and by descriptive and analytical cataloging guidelines. For the most part, traditional cataloging deals primarily with monographs and serials, and not with technical reports or other similar fugitive materials.[5] Since the VES collection consists of exemplary projects, vocational education plans, publications from the states and territories, ERIC documents, and ephemarae, *AACR* and LC classification schemes do not fit all of the

specific needs of this technical literature. Likewise, the LC subject needs of this technical literature. Likewise, the LC subject headings for vacational education are far too general to supply specific topical access even with the direct and indirect headings options.[6]

Even though the *AACR* guidelines for establishing author, title, and publication date entries were eventually adopted, VES faced bibliographic description problems peculiar to its own materials. Indiana State Board of Vocational and Technical Education project numbers had to be included in the bibliographic record for retrieval purposes, as well as sponsoring agency, identifiers, fiscal year designation, budget figures, and target audiences of each project. After realizing that the established cataloging rules were not entirely suitable and that the 3x5 catalog card did not provide the numerous access points needed, a classification and cataloging standard which was more applicable to education report literature was selected.

In view of the information storage and retrieval needs of the collection, the *ERIC Processing Manual* was adopted and adapted as the cataloging standard for VES.[7] This four volume manual for indexing and abstracting report literature was developed by ERIC under the auspices of the National Institute of Education (NIE). In conjunction with the cataloging rules, ERIC also developed a controlled vocabulary list, the *Theasaurus of ERIC Descriptors*, which is applicable to all areas of education. Since VES had a five year accumulation of documents to process, along with the daily influx of new materials, a rapid, but flexible bibliographic record processing system was needed. Since catalog cards would take too long to type, reproduce, and file, and would be difficult to change in the event that the bibliographic information had to be updated, it was decided that an automated system was the only solution.

The work toward an automated system for VES began with the development of a cataloging workform based on the ERIC Report Resume Processing Form.[8] Unlike the catalog card, which is the basic element of the traditional library retrieval system, the processing workform, which "has a passing resemblance to the library catalog card, is only a transitional step in a process which ultimately leads to the addition of a record to a computer file."[9] As a result, the production of indexes and other forms of retrieval "are produced in whole or in part from this computer file [and] not from the [processing workform]."[10] In order to accomplish these information storage and retrieval feats, the bibliographic record has to be "rich enough in detail to be responsive to any need."[11] Library automation is bibliographic file oriented and not procedure oriented.[12] Thus, the design of the document handling system made provisions for the constant updating of the changing elements of the bibliographic records.

Since the SBVTE exemplary projects, consisting of proposals, final reports, and products, were the most complex of the VES materials to catalog, the processing workform was designed with ten fields. The INNU field contains the VES number with an IN prefix, a general media designator, denoted by "report type," and a slot for the recording of an ED number in the event that one of the SBVTE reports is added to the ERIC system. An INNU entry such as "IN-760059 Final, ED167698" means that the document is an SBVTE final project report conducted in the 1976 fiscal year, which has been assigned the accession number 59, and which also appears in the ERIC system under ED167698. This system was devised because it could reflect the diffferent media in the collection by changing the two letter prefix and because the accession number concept could expedite the classification of a rapidly growing collection. Most importantly, this type of numbering system serves the basic function of a call number which is to provide a location on the shelf for the document.

The title (TITL) and author (AUTH) fields are completed according to AACR guidelines. In the event that the document has no title page, the cataloger takes the bibliographic information from the cover page. A title may be fabricated if there is no title on the document. VES denotes a fabricated title in its entry by placing it within brackets. In defiance of standard cataloging practices, VES does not maintain an author entry verification file because of the inordinate amount of time involved. For VES' purposes, the standardization of this file is not as vital to the cataloging process as is that of the agency or identifier file.

The agency (AGCY) field is filled in according to the *COSATI Standard for Descriptive Cataloging of Government Scientific* and *Technical Reports*. The institution index in one of the monthly *Resources in Education* (RIE) may also be consulted to verify the entry for a specific agency. In an effort to standardize the agency entries for retrieval purposes, an agency authority file is maintained by the cataloger.

Descriptors from the *Thesaurus of ERIC Descriptors* are used in the descriptor (DESC) field to identify the document's subject matter. ERIC descriptors, and not LC subject headings, are used because they were developed for the field of education and because descriptors go a step beyond subject headings by expressing the concepts encountered in the related literature of a specific topic. As a result, this particular controlled vocabulary is more applicable to the technical documents in the VES collection. Since all documents in the VES collection deal with some aspect of vocational education,

the descriptor, "vocational education," is used rather sparingly. Even though ERIC assigns this descriptor automatically, the VES indexer does not usually include it in the ERIC document's bibliographic record. The inclusion of "vocational education" in each record would be redundant and would take up too much space in the data base.

The identifier (IDEN) field contains proper nouns which are used as descriptors. This field is important because it provides access points to acronyms, organizations, geographic locations, legislation, and project names which are not included in the controlled vocabulary list.

The publication date (YEAR) is determined according to AACR guidelines. With SBVTE reports, the fiscal year is denoted by FY80 and the actual dates of the project funding are also recorded, such as "October 1, 1979 to September 30, 1980."

The number assigned to each project by the SBVTE is recorded in the grant number (GRNT) field. This number must be included in the bibliographic record because it is the primary access point for the SBVTE. This number reflects the federal funding source for the project. The 1976 vocational amendments (PL 94-482) consist of Part A divided into five subparts, Part B divided into three subparts, and Part C. Most SBVTE projects are funded under Part A, subpart 3, Program Improvement and Supportive Services, which has six numbered sections; 131-research projects, 132-exemplary projects, 133-curriculum projects, 134-guidance projects, 135-professional development projects, and 136-sex stereotyping projects. The last digit of these federal sections are used as the final digit of the SBVTE grant number and the roman numeral, III, indicates Part A, subpart 3. Thus the number 10-80-III-4 means that this was the tenth project funded in 1980 under subpart 3, section 134 (guidance).

The subpart and section of the law, as well as the local and federal monies, are recorded in the monies (MONY) field. This field assists those researchers who are planning to undertake a similar project by providing basic budget figures at a glance.

The population (POPL) field describes, via a numerical code, the target audience of a project and the research populations involved in a project. For example, a project which assesses employment opportunities for handicapped vocational education students would be assigned the codes for the following population groups: target-handicapped (105), student (117), high school (134), post-secondary (135), and research-employer (215).[15]

The following is an illustration of a completed SBVTE project record:

INNU	IN780109 final, ED188631
AUTH	Brooks, Joann; Steenhausen, Nancy
TITL	Implementation of the Expanded Indiana Vocational Education Information Services.
AGCY	Indiana University, Bloomington.
DESC	Information Dissemination, Information Services, Vocational Teachers, Information Retrieval, Publications
IDEN	Indiana, Veis, Vocational Education Information Services
YEAR	FY78, October 1, 1978 to September 30, 1979
GRNT	267-78-III-124
MONY	*LP III, 131, 132, 134, *L 35110, *SF 83200, *T 118310
POPL	134, 135, 136, 137, 119, 121, 234, 235, 236, 237, 219, 221

It is only in the case of SBVTE documents that all ten fields are used on the workform. Due to the flexibility of the cataloging system, the format may also be contracted. Fugitive documents such as annual and five-year state plans for vocational education and reports published by other state education agencies receive minimal indexing:

INNU	IN000042
AUTH	Gableman, John L.
TITL	Careers for Youth Survey, Georgia, 1971-76. Survey of Employment Opportunities, Career Ladders and Training Requirements for Basic Jobs in the Vocational Job Cluster, 1971-76.
AGCY	Georgia Institute of Technology, Atlanta. Industrial Management Center.
DESC	Occupational surveys, Employment Opportunities, Career Ladders, Job Training, Occupational Clusters
IDEN	Georgia
YEAR	1972

Reference materials are assigned an accession number along with a unique two letter prefix which reflects document type e.g., ZD = reference directory, and are then indexed in the same manner as are fugitive documents:

INNU	ZD000008
TITL	Vocational industrial clubs of America. National Directory.
AGCY	Vocational Industrial Clubs of America, Falls Church, Virginia.
DESC	Directories, Youth Clubs, National Organizations, Trade and Industrial Education
IDEN	VICA, Vocational Industrial Clubs of America
YEAR	1975

In an effort to avoid duplication of effort, VES' ERIC documents are indexed as their records appear in RIE using limited fields and including only major descriptors:

INNU	ED164978
AUTH	Kane, Roslyn D.
TITL	Preparing Women to Teach Non-traditional Vocational Education. Information Series No. 137.
AGCY	National Institute of Education, (DHEW), Washington, D.C.
DESC	Females, Retraining, Teacher Education, Trade and Industrial Education, Vocational Education Teachers
IDEN	Nontraditional Occupations
YEAR	1978

After the items have been cataloged, the workforms are checked for conformity and accuracy and are added to the "to be input" folder where they await entry into the VES in-house data base.

Data Base Management

The selection of software was relatively simple as the data base management packages supported by Indiana University's CDC6600 and Cyber 172 were very limited. When the search for software began, there were two locally developed programs which were considered. They were rejected because one program only created indexes and the other only furnished searching capabilities and the file formats of the two were not compatible. A third program, INFOL-2, developed by the Control Data Corporation was also available. Since it was designed specifically for information retrieval, the creation of indexes from the data base is not part of the program.

In order to create indexes from an INFOL-2 data base, it was necessary to adapt the local indexing program.

Even with its drawbacks, a decision was made to go with INFOL-2. The file structure was being designed when chance intervened. A computer science student, Michael Coulter,[16] suggested that VES look at Famulus, a software package that had been acquired for the Indiana University School of Library and Information Science, but which was not yet completely operational. Though not perfect, Famulus was far superior to the other packages and it was quickly decided to adopt it to manage VES' data base. Fortunately, Mr. Coulter was excited about the challenge and VES hired him to implement its Famulus system.

Famulus is not an acronym but rather a job title for a medieval sorcerer's attendant or assistant.[17] It was developed by the Forestry Service of the U.S. Department of Agriculture as a personal documentation system. Famulus is written in Fortran and consists of eight main programs: (1) *Edit* which allows the user to correct, add to, or delete from the data base, (2) *Sort* which rearranges the file order by changing the order of the fields within records so that the data base can be sorted alphabetically on any field, (3) *Merge* which provides updating capability, (4) *Galley* which prints the data base in several formats, (5) *Vocab* which prints in alphabetic order the words in any given field (i.e., a concordance program), (6) *Index* which creates indexes to the data base on the field specified, (7) *Search* which uses Boolean logic to query stipulated filed(s) of the data base, and (8) *Ossify* which punches a card deck equivalent to the data base for backup or for massive corrections.

Famulus allows up to ten fields with each assigned a four-character name. These fields determine the access points to each citation in the data base and thus must be carefully chosen. The ten fields which VES defined have already been identified in the technical processing section and are therefore not repeated here. The original fields and their contents have worked well for VES' applications with the exception of the punctuation adopted in the author (AUTH) field. The Famulus Index Program uses the comma (,) as the delimiter and the VES Information Specialist chose to enter the author in the standard format (i.e., last name, first name). Unfortunately this means that VES is unable to create an author index, although it is possible to sort on the author field and thereby produce an alphabetical list of first authors. The author field is also accessible through the search program, only the creation of an author index is nullified through the misplaced comma.

Famulus was designed as a batch program to be used with card input and paper output. The running of any of the eight programs calls for different machine specific control cards as well as Famulus

specific cards. In order to search, for example, the machine cards get the data base and the Famulus search program. The Famulus cards name the data base, set the output line width, specify the fields to be searched and the search strategy.

The Indiana University computer allows batch submission from a remote terminal which saves punching and submitting cards for each run. Keeping track of the numerous control cards needed for each type of run, however, became time consuming and frustrating. Again, Michael Coulter came to the rescue. He wrote an interactive Pascal program which allows the terminal operator to call any of the Famulus programs, specify parameters, and then submit the job in batch mode.

The interactive program asks the user which Famulus program is needed. Depending upon which Famulus program is specified, the interactive program then asks a series of questions which allows the user to specify fields, to select output width, to decide whether to print field labels, and to specify the location of the printer for final output. In addition, many of the responses to queries are repeated so that the user can correct any errors without starting over. Using the answers to these queries, the Pascal program translates them into appropriate machine and Famulus control commands and writes them to output files. The output files are then submitted in batch mode. A search of the data base can be run using this interactive Pascal program and the results can be printed immediately at the terminal or later off-line. While the search is not interactive since the strategy cannot be changed once it has been submitted, the immediate online access has been invaluable.

A final procedure in the Pascal program does not call a Famulus program but processes interactive entry of new citations. The procedure asks for the first field (INNU) which is then typed in followed by a semicolon. It then asks for the author (AUTH) which is entered followed by a semicolon, and so on, through the record. The semicolon is used to delimit each field, a slash to delimit each record, and a dollar sign to end the session. The result of each session is a file of new citations in Famulus input format which can be edited for errors and then added to the data base with the Merge program. The standardized processing workforms and the interactive entry program allow VES to use minimally trained personnel for data entry.

The Famulus program has many disadvantages, the batch mode of access being the primary one. Moving from a vendor search of ERIC to searching the in-house data base using Famulus can sometimes be very frustrating, but for a low-budget computerized library

operation, Famulus completely filled VES' needs. Famulus allows the production of printouts of the data base in alphabetical order by number, title, agency, and first author. VES produces indexes of descriptors, identifiers, grant numbers and acquisition numbers. These printed tools are often all that are needed to answer a specific question. In addition, the data base can be searched on any field when necessary, producing results online or off-line. Famulus is not perfect, but with the development of the interactive Pascal program, it has met VES' needs.

Reflections

When the VES library was established, its primary objective was to develop a flexible, multifunctional system to acquire, process, store and retrieve information. The decisions made in the design and the development were based on the need for flexibility and adaptability to changes over time as well as expeditious processing of the materials in hand. During the implementation of the system, as with all new systems, occasional changes were necessary as new problems arose. Both the technical processing systems and the Famulus program adapted to these changes without major modifications.

The true adaptability of the Famulus program and the VES technical processing system was put to the test when VES acquired 2000 documents and audiovisuals from the Indiana Curriculum Materials Center (ICMC). ICMC, formerly located in Terre Haute, began in 1970 as a resource center to provide materials for vocational education practitioners. Its collection was moved to Bloomington in October 1980 after the SBVTE realized that a central location for research and curriculum materials would better suit the needs of students, researchers, and teachers.

Two months before the collection was moved, the bibliographic record for each ICMC document was entered into a new database. The records were taken from the most current ICMC catalogs available. After modifying the numbering scheme, the new acquisition numbers, titles, and abstracts were put online so that the VES staff

could retrieve the documents more readily. Requests for these materials did not cease just because the collection was in a state of transition.

The diversity of the ICMC collection presented new challenges to the VES cataloger. The collection consists of print and non-print media, including games, kits, films, sound recordings, slide and tape presentations, and special needs materials. In order to record the bibliographic informaiton needed to produce annotated catalogs for the use of teachers, the cataloging form was slightly altered. The fields remained, but an abstract (ABST) field replaced the grant field and the description (COMT) field replaced the monies field. The content of the population (POPL) field was changed to reflect grade level, rather than target populations.

Two letter prefixes, followed by the already established ICMC classification field and accession number, make up the call number. IC050020 denotes special needs curriculum print material, whereas AV050011 identifies a special needs audiovisual item.

The media type, such as slide/tape, is recorded only for non-print materials. Following VES practice, the ED number is also recorded when one exists. The author, title, agency, descriptor, identifier, and year fields are completed just as they are for VES documents. An abstract, however, is written for every curriculum item. The purpose of the abstract is to give teachers a more complete description of the document. Most of the abstracts written are a blend of informative and indicative styles.[18] The description or comment field is used to describe the number of pieces in a kit and the physical description of a film, such as type, millimeter, and length. The grade level is designated by a numerical code.

Since VES already had an operable technical processing system, there were no major problems with adding the ICMC materials to the existing collection. Even though the cost per unit of cataloging the ICMC documents was slightly higher (i.e., $5.52) than that of VES documents (i.e., $2.60) due to an increased number of personnel working in a shorter time period, the cost per unit for cataloging curriculum materials has already begun to decrease.

By using automation to simulate classical library techniques, VES has satisfied its needs for information storage and retrieval. Frederick G. Kilgour acknowledges that ". . .it is difficult to see how the course [of library computerization can be] otherwise [since] technology advances from an existing base."[19] He, as well as other

observers, seem eager to move into a "central-station type of computerization, rather than local, dedicated library computers."[20] Obviously, VES offers the latter type of system. Even so, it is hoped that the VES system can act as a role model for and offer guidelines to other special library librarians who are searching for an adaptable, cost-effective automated system.

Notes

1 Simmons, Peter. "Library Automation," *Annual Review of Information Science and Technology*. Vol. 8. Cuadra, Carlos A. and Ann W. Luke, ed. Washington, D.C.: American Society for Information Science 1973, 167.

2 Alper, Bruce H. "Library Automation," *Annual Review of Information Science and Technology*. Vol. 10. Cuadra, Carlos A. and Ann W. Luke. ed. Washington, D.C.: American Society for Information Science, 1975, 226.

3 Eigeman, Elaine G. and JoAnn Brooks. *The Continuation and Expansion of a Reserach and Development Information System. Final Report.* Bloomington: Indiana University, 1978.

4 Bierman, Kenneth J. "Library Automation," *Annual Review of Information Science and Technology*, Vol. 9. Cuadra, Carlos A. and Ann W. Luke, ed. Washington, D.C.: American Society for Information Science, 1974, 158.

5 *ERIC Processing Manual. Rules and Guidelines for the Acquisition, Selection, and Technical Processing of Documents and Journal Articles by the Various Components of the ERIC Network*. Bethesda, MD: ERIC Processing and Reference Facility, 1974, 143.

6 See *Library of Congress Subject Headings II*, Library of Congress, 1980, Washington, D.C.: 2493-94, for the listings and cross references for vocational education subject headings.

7 Eigeman, Elaine G. and JoAnn Brooks, 57.

8 *ERIC Processing Manual*, 146.

9 *Ibid.*, 143.

10 *Ibid.*

[11] Avram, Henriette D. "Library Automation," *Annual Review of Information Science and Technology*. Vol. 60. Cuadra, Carlos A. and Ann W. Luke, ed. Chicago: William Benton, 1971, 185.

[12] *Ibid.*

[13] U.S. Congress. *Education Amendments of 1976*, P.L. 94-482, *Title II-Vocational Education*. Washington, D.C.: 94th Congress, 2nd Session, October 12, 1976. 90 STAT. 2091.

[14] Brooks, JoAnn and Nancy Steenhausen. *Implementation of the Expanded Indiana Vocational Education Information Services. Final Report.* Bloomington: Indiana University, 1980, 97-8.

[15] *Ibid.*, 100.

[16] Michael Coulter was instrumental in the development of the VES System and later assisted other Famulus users at Indiana University, Bloomington. Now he works as a programmer with a local software firm.

[17] Burton, Hilary D. and Theordor B. Yerke. "Famulus: A Computer-Based System for Augmenting Personal Documentation Efforts," *Proceedings of the American Society for Information Science*. Vol. 66. North, Jeanne B., ed. Westport, CT: Greenwood Publishing Corporation, 1969, 53.

[18] Rowley, J.E. *Mechanised In-House Information Systems*. London: Clive Bingley, 1979, 34.

[19] "Library Automation," *Annual Review of Information Science and Technology*. Vol. 4. Cuadra, Carlos A. and Ann W. Luke, ed. Chicago: William Benton, 1969, 328.

[20] *Ibid.*, 329.

If you are interested in obtaining the unpublished graphs and data from Barbara Kasper's article, "Children's Services in Indiana Public Library," please write to her at the Indiana State Library, Extension Division, 140 N. Senate Avenue, Indianapolis, IN 46204. The article was published in the Fall 1981 issue of *Indiana Libraries*.

INDIANA LIBRARIES

A Quarterly Journal

Manuscripts should be sent to the editor, Jill P. May, INDIANA LIBRARIES, 118 Matthews Hall, Purdue University, West Lafayette, IN 47907.

Content: INDIANA LIBRARIES publishes original articles written with the Indiana library community in mind. Each issue is theme oriented, but the Publications Board welcomes other timely contributions.

Themes and Deadlines:

Theme	Issue	Manuscript Deadline
Collection Development	Summer 1982	March 1, 1982
Children & Young Adult Services	Fall 1982	June 1, 1982
Potpourri	Winter 1982	September 1, 1982

Preparation: All manuscripts must be double spaced throughout with good margins. Writers should follow the format described in the *MLA Style Sheet* (Second Edition); should be identified by a cover sheet with author's name, position and address. Identifying information should not appear on the manuscript. Photographs or graphics are welcome and should accompany manuscript if applicable. Contributions of major importance should be 10-15 pages double spaced. Rebuttals, whimsical pieces, and short essays should be 2-7 pages double spaced.

Processing: Manuscripts will be acknowledged upon receipt, and a decision concerning use will be made twenty days after the issue manuscript deadline. The editor reserves the right to revise all accepted manuscripts for clarity and style. Upon publication, the author will receive two complimentary copies.

INDIANA LIBRARIES
INDIANA LIBRARY ASSOCIATION
1100 W. 42nd Street
Indianapolis, Indiana 46208

ADDRESS CORRECTION REQUESTED