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ABSTRACT

Despite recent research and development in the field of library automation, libraries have been unable to reap the benefits promised by technology due to the high cost of building and maintaining their own computer-based systems. Time-sharing and disc mass storage devices will bring automation costs, if spread over a number of users, within the range of economic feasibility. Now, the distribution of the Machine Readable Cataloging Code (MARC) II tapes by the Library of Congress is dramatically cutting the costs for data conversion. The combination of these advances is about to open up the automated library services market for serious business. (Author/MF)

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(2) MARC AND THE LIBRARY SERVICE CENTER: AUTOMATION AT BARGAIN RATES

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There are two questions in the minds of many librarians: "What do I have to do to automate my library?" and, "What do I have to do to use the MARC tapes?" The answer to both questions is: Nothing. Within one or two months, librarians will be able to buy a bagfull of automated products and services without putting a large dent in their budgets or learning to speak computerese.

Imagine the following scene in a technical processing office. The office looks like any such office you are familiar with, except that in this office the piles of books being processed are somewhat lower. The only other difference—and even this will not be a difference for some libraries—is the presence of a teletype machine.

The technical processing librarian hands a list of books to be ordered to a clerk. Instead of turning to her typewriter, the clerk goes to the teletype. For each order, she types in the Library of Congress card number and any special ordering instructions, such as an infrequently used book fund to be encumbered or the name of the person who requested the book's purchase. Afterward, the teletype writes out a request for more information for one of the orders; that book is unusual because it had not been cataloged by the Library of Congress. The clerk types in the basic bibliographic description for the book.

In another part of the office a receiving clerk checks over a shipment of books. When she completes the check-in process, she takes her turn at the teletype to write a brief note about the receipt of each book. The books themselves go on to Cataloging.

During the day the receiving clerk gets a package of forms and listings from a nearby Library Service Center. The package contains book orders on the familiar 3x5 inch multiple part form, a computer printout listing of the orders, several duplicate copies of claim letters sent to a vendor who hasn't delivered on time; sets of catalog cards or worksheets, and book pockets and spine labels, for the books which were received one or two days ago; a stack of announcement bulletins describing the library's latest acquisitions; a set of punched book cards to be used with the library's automated circulation system; and a set of listings describing yesterday's circulation transactions. The clerk passes the various forms and listings to the appropriate people.

The head librarian has a question about the status of one of her book funds. Instead of going to a ledger or report, she goes to the teletype and types in her question. The teletype writes out the answer to the question within a few seconds. While she is at it, the librarian also asks a question about the status of one of the book orders. Again, the answer is written out almost immediately.

Later in the day, a reference librarian seats herself at the teletype. She needs a special bibliography for a patron. By typing in a subject heading, or LC class number, or Dewey class number, she has the bibliography in just a few minutes. If the list of books proved to be a long one, she could request that the list be printed at the Service Center and sent to her the next day. This "off-line printout" would keep the teletype from being tied up for a long time.

The kind of library we've been looking at is not, necessarily, a large and well funded academic or public institution with its own library automation project. It could be the library for a small city, or the processing center for a school system, or a junior college, or a centralized technical processing office for a library network. Any library with a volume of work requiring more than a very few librarians and clerks may find the kind of automated library services we've just described to be economical and easy as well as providing new techniques which add to the library's capabilities for serving its patrons.

Without making large investments to build computer systems of their own, many libraries are going to be able to realize some concrete benefits from the latest developments in library automation. Progress in developing automated assistance which the average library can afford has been slow because developmental costs have been huge, computing machinery has not been

readily adaptable to handling library operations, and operating expenses could not be brought within a justifiable limit. In addition, the cost for turning a library's catalog and other bibliographic records into machine-readable form has been so high as to be out of the question for most libraries whose budgets are limited and subject to the exacting scrutiny of penny-conscious legislators.

Now, however, the computer technology known as "time-sharing" provides an economical alternative to each library's installing and operating its own computer system. Time-sharing permits a computer at a central location to work for a number of users simultaneously. Computers have become so large and so fast that a single user at a time is not likely to require more than a small percentage of the computer's capabilities. It is thus more economical to have the computer working for several people at the same time. To each user, it appears that he has the computer all to himself. An additional benefit made possible by time-sharing is the capability for a user to be "on-line" to the computer. During the on-line operation, the user and the computer are able to talk to each other. This is a desirable feature when you want a quick answer to a question or when you want to pass some information on to the computer at your convenience instead of at some rigidly scheduled time.

A user talks to the computer through a terminal such as the teletype machine. The terminal and the computer are normally connected with each other by an

ordinary telephone line. Several kinds of terminals are available today, although none of them is completely satisfactory for library use. The teletype machine, however, has an advantage for libraries in that it may be used both as a computer terminal and as an ordinary telecommunication device which some libraries are already using for interlibrary loan.

With time-sharing, one major impediment to practical library automation has been removed. The other major stumbling block—the cost for converting the catalog record to machine-readable form—is on the way out as a hindrance to library automation. The Information Systems Office of the Library of Congress, headed by Mrs. Henriette D. Avram, has performed an outstanding service for the library community at large. Their achievement in designing and gaining acceptance for the MARC II format is historic. The efforts of a few people at the Library of Congress to develop and operate the MARC II system for distributing cataloging data in machine-readable form will have an incalculable payoff for the whole library community.

With the advent of MARC II, more and more monographs will be included in machine-readable catalog records available from a central source and prepared by the most authoritative body of catalogers in the country. Almost as important is the acceptance by the library community of a standard format for communicating cataloging information on magnetic media such as tapes or discs. Because only one computer program is needed to interpret the standard

format, the cost for writing many programs to handle many different formats is eliminated almost entirely. The largest proportion of computer programming costs in the past has been closely connected to the necessity for processing data appearing in variegated formats. Acceptance of the MARC II format as the standard for the library community makes possible economies in programming which will significantly reduce automation costs.

The most immediate effect of the MARC tapes is likely to be felt in the area of library acquisitions and technical processing. With a major portion of the bibliographic data required by all libraries for book ordering and cataloging already available in machine-readable form, the processing effort should be greatly simplified since automated assistance will be economically feasible. Instead of hundreds or thousands of clerks all over the English-speaking world laboriously typing out almost identical orders for the same book, machines will be able to perform this chore. Instead of using clerical labor for maintaining in-process and accounting files, librarians can use computers to perform the bulk of the necessary record-keeping processes while the clerks can be used more profitably in improving library services to patrons.

The current trend toward centralization of the tedious, time-consuming, and labor-heavy details of book ordering and processing will probably be reinforced by the availability of MARC tapes. A few keystrokes are all that is necessary to place an order or record the receipt of a book. With just

this little manual labor to start things off, an automated system working from the MARC tapes can go on to produce cataloging worksheets, accounting reports, book cards, book pockets, and spine labels exactly when needed to ready the books for shelving. A central processing agency will be an efficient and effective operation, relieving individual libraries from the problems of managing a production line, yet allowing for special requirements for each library. Centralized processing may not even have to be a library function; a few large book vendors are rapidly developing their own technical processing centers.

The development of the CARDS system by the Library of Congress also lends weight to the centralization of book processing. With CARDS, the amount of time required by the Library of Congress to fill orders for catalog cards will be cut significantly. The MARC tapes will provide cataloging data which will be fed into a large photocomposition machine to produce graphic-arts-quality printed cards. The whole operation will be set into motion in direct response to orders sent in by libraries and processing centers; this will be much more efficient than the present system of trying to fill orders from stock on hand. Assuming that cards can be delivered almost as fast as proof slips are now, there will no longer be as much need for local production of cards for those books which the Library of Congress has cataloged.

With a significant proportion of a library's holdings already in machine-readable form thanks to MARC, the cost of converting the remainder of a library's catalog will be greatly reduced. The cost reduction will become even greater as the availability of non-MARC bibliographic data (in MARC format) increases with the conversion of more and more catalogs. When a complete catalog is in machine-readable form, automation can be extended to other library processes. Book catalogs may be produced and cumulated quite economically, especially if computer-to-microfilm (COM) output provides an acceptable quality of print. Even if COM is not satisfactory for some libraries, photocomposition may provide a suitable means for producing graphic-arts-quality book catalogs. The cost for photocomposition is kept high at present by the small volume of work being supplied to expensive but highly productive photocomposition machines. As volume increases, the cost for photocomposition will drop dramatically.

In fact, with COM, the "scroll" catalog may join the card file and the book as a popular catalog form. A scroll catalog, on roll microfilm, has some of the advantages of a book catalog plus the important advantage of low cost. A roll microfilm master can be produced cheaply with COM and can be duplicated any number of times for little money more. Microfiche sets of the catalog can be made easily from the master roll for people who find sheet microfilm easier to use than roll film. The scroll catalog is already in wide use in business and industry; Sears and Roebuck, for example, has its parts catalog on microfilm at each store. The New Jersey State Library demonstrated

a catalog or microfilm cassettes at the ALA Conference in Atlantic City this last June. The scroll catalog, especially when used for relatively small collections such as found in schools, junior colleges, and colleges, would be cheap enough that library patrons could well afford to buy their own copy, assuming they had easy access to a microfilm reader. In such an eventuality, what would be the implications for circulation, especially if patrons could place mail or phone orders?

Union catalogs will be especially easy to produce and maintain. This should be a boon for library networks or systems at any level--city, school, county, region or state--with automated assistance for interlibrary loans and a special capability for shifting books within the network to meet sudden demands. Union catalogs could be made available in either book or scroll form. Another alternative might be to do away with catalogs altogether, using a terminal to search the catalog records stored on the computer. The computer-based records would always be up-to-date, cumulated, and correctly filed.

Reader services will be enhanced by the ability, using MARC and MARC-formatted bibliographic information, to produce special bibliographies and reading lists regularly or on demand. This feature might be especially useful for school and academic libraries, which would supply both teachers and students with a wide variety of special purpose bibliographies with very little effort on the part of the librarian. For public libraries, it would be possible to provide special reading lists at opportune moments to take advantage of local events, or to service special community groups.

Such are some of the library services made possible through the combination of time-sharing and the availability of the MARC tapes. Imaginative librarians will undoubtedly think up new services. In fact, the most exciting thing about this library automation business is that librarians will be relieved of stock jobbing and can devote their full attention to providing just the right book or information to the right person at the right time.

At this point, you may say, "Promises, promises, but I've heard all this before!" True, you probably have, since automation experts and information scientists, like other pioneers, tend to be incurable optimists. But now the optimism is justified by the impending capability to deliver on some of the early promises of automation. The key to this capability is the development of the Library Service Center concept.

At the American Library Association Conference in Atlantic City, there were several exhibitors whose displays and demonstrations hinted at the emerging concept of the Library Service Center. Some of the largest book vendors were offering an increased range of purchasing and processing services, one going so far as to offer a computer program for sale. The Library of Congress exhibited a detailed and beautifully illustrated description of the plans for the CARDS system which automates the servicing of orders for catalog cards. System Development Corporation used a teletype terminal connected by telephone to a computer in Santa Monica, California, to

demonstrate on-line retrieval of bibliographic data from a MARC-based file. Even though the program used for the demonstration was not designed for librarians, visitors to the exhibit had little difficulty in learning to operate the program themselves.

From the beginnings in evidence at Atlantic City, there should be a rapid emergence of a true central agency or firm offering a wide range of computer-based products and services. The Library Service Center will be an organization of librarians. computer specialists, and clerks who will operate a time-sharing system which provides as little or as much automation as required to service a number of client libraries. The Service Center might be operated by a library organization such as a state library or regional library network, but more probably--at least for the near future--it will be run by a commercial firm.

The Service Center will receive the weekly MARC tapes from the Library of Congress, prepare special indexes from the tapes as desired by the customer libraries, then add the bibliographic records to a master cumulated file to which the central computer has access. As the customer libraries engage in transactions with the Service Center through the time-sharing teletype terminal located at each library, the central computer will use the master file in various ways to record book orders, answer requests for bibliographies, or provide cataloging information. The computer will also save some information in special files to be processed at a later time or by another

computer which operates more efficiently in batch mode rather than in time-sharing mode. An in-process file for each customer library will be maintained on-line so questions about the status of any item can be answered immediately.

From time to time, as needed, the files for book orders and cataloging materials will be processed by the computer. As the end product of this processing, computer-printed book orders, technical processing, and cataloging materials will be delivered to the clerks who will perform quality control checks and package the materials for delivery to the customer libraries, or to vendors or technical processing centers.

On a daily basis, the circulation programs will be run to provide customer libraries with listings showing which books are out or have been returned. Overdue notices will be produced automatically. New book cards will be punched if replacements are needed. For customers who want to make a statistical analysis of circulation transactions, the Service Center will adapt standard programs, or will write a new one, to do any kind of analysis on the data available that a librarian can imagine.

A Service Center might also provide consultants who can work with a customer to determine whether or not a book or scroll catalog would be desirable. If it were, then the consultants could assist the customer to design an attractive format for the catalog and they would handle the technical problems

involved in getting the catalog composed and printed. Once the catalog is produced, the Service Center would be able to produce supplements and cumulations when needed as a simple byproduct of the customer's normal acquisitions activities handled by the Center.

In using a Service Center, customer libraries will pay only for the products and services they need. A customer may start or stop service pretty much at will, since there will be little investment of money or manpower on the library's part. The Service Center may be just the answer for those libraries which have been considering beginning an automation project of their own but have had difficulty in justifying the heavy costs even just for planning and directing such an effort. A great deal more of an investment would be necessary to acquire a group of system designers and computer programmers who have some knowledge of the special problems involved in library automation, and to pay the cost of computer time for system development. The Service Center concept is a logical division of labor; information processing, computer, printing, and production experts perform their special functions without bothering the librarian, and the librarian is left free to concentrate on his special professional problems of serving the library's patrons more effectively.

There has been a great deal of research and development in the field of library automation during the last few years. Operating libraries have been unable to reap the benefits promised by technology, however, because

of the high cost for building and maintaining their own single purpose computer-based systems and for converting bibliographic data to the form required for computer processing. But computer and programming technologies, such as time-sharing and disc mass storage devices, bring automation costs, if spread over a number of users, within the range of economic feasibility. Now, the distribution of MARC II tapes by the Library of Congress is dramatically cutting the costs for data conversion. The combination of these advances is about to open up the automated library services market for serious business.