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Computer-Based Systems, A New Dimension to Library Cooperation*

The computer has added a new dimension to library cooperations. The recent experiences of the Ohio College Library Center's computer-based cataloging system illustrate how the computer can facilitate interlibrary cooperation. The paper also presents some of the difficult organizational problems which must be coped with in developing a computer-based cooperative system.

THIS PAPER PRESENTS the concept that library cooperation through computer-based systems enables librarianship to establish new substantive and economic goals. Computerized cooperation also opens up untrodden avenues of research and development, and by making unnecessary the imposition of uniformity on library processes, the new cooperation creates hitherto unexplored opportunities for intellectual development in the profession. However, computerized cooperation is, at the present time, in a highly dynamic and incomplete state of development and operation. Such activities at the Ohio College Library Center have turned a major corner into a new period of library evolution but even the OCLC has taken only a few steps into a vast and unexplored area.

As is well known, it was the lure of the benefits of cooperation more than any other one factor that stimulated librarians in 1876 to establish the American Library Association. One of the

first important committees of the Association was the Cooperation Committee that instituted a variety of standards that enabled libraries to cooperate and to reduce costs if not expenditures. One of the early accomplishments of the Cooperation Committee was initiation of the establishment of a standard size for catalog cards. This accomplishment enabled libraries to purchase cards much more cheaply because they were mass produced, and similarly to obtain inexpensive cases in which to house the cards. Prior to the acceptance of a standard size card, each library obtained a special size card from a paper manufacturer and had a cabinet maker build special cabinets in which to house the cards. Moreover, the employment of a card of a standard size meant that it was possible to interchange cataloging information among libraries, a process that made possible the dissemination of catalog cards among libraries.¹

The standardization that made possible the interchange of cataloging information, and thereby a reduction in cataloging effort, was a simple technological standardization. Today, another technological event, the advent of the digital computer, enables a new type of cooperation—a cooperation which for the first time will enable the profession

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to attain some of the goals hoped for a century ago as well as other goals entirely unanticipated at that time.

Despite the fact that cooperation has long enjoyed a limited success in librarianship, there exists no definition of library cooperation, and this paper will not present one. However, there are at least three qualities that characterize library cooperation. First, and of most importance, cooperation makes possible the establishment of new objectives for a group of cooperating libraries as distinguished from the classical goals of individual libraries. Altogether too often a library cooperative is thought of by its members as supplying each member with a service to further its own goals. Such service centers have enjoyed only limited successes. A truly cooperative center establishes goals that are not achievable by individual libraries.

A second quality of cooperation is the sharing of resources without cost to the institution providing the resources. An example here is the shared cataloging project of the Ohio College Library Center (OCLC), wherein it does not cost the original cataloging library anything to have another library use the central files. Of course, to be truly cooperative each participating institution must do its small share of contributing cataloging information to the central data store.

A third quality of cooperation is the pooling of human and financial resources to achieve a system unattainable by individual libraries; another example from OCLC will illustrate this characteristic. It is most doubtful that any library in Ohio could afford to operate the computer system that OCLC maintains. Moreover, there are few individuals qualified to do the research, development, and maintenance necessary to sustain the operations of such a center. The parent institutions of a number of academic libraries participating in the center do not even possess a small

computer, but OCLC makes available to their libraries computer power that the entire institution could not afford.

Although computers possess a variety of capabilities which enhance library cooperation, only two of those capabilities will be discussed. The first is the computer's enormous power to treat an individual person as a person, and an individual event as a unique event. Second, a computer-based system has the capability of operating an information system that can supply information to a person when and where that person needs that information.

NEW OBJECTIVES

Cooperatives which possess expensive, manual union catalogs have sought to improve the bibliographic accessibility to resources within a region. Such union catalogs have attained only limited success because the catalog exists in but one place. What was needed was a technology that would make union catalog information available throughout the region. Until the advent of the computer, the only solution to this problem was an extravagantly costly printed book catalog which never contained the listings of publications most in demand—namely current publications. The computer has made possible a less costly bookform catalog that can be kept more up to date than could manual bookform catalogs, but even this process does not thoroughly solve the problem of providing information on news publications.

A cooperative based on computerizations, like OCLC, can establish the new objective of making up-to-date catalog information available to persons throughout the region—a heretofore unattainable objective and, therefore, an undefined objective. At the present time, the OCLC system enters one-quarter of the institutional-holdings information into a central data base at the time cataloging is performed, and the other

three-quarters on the evening of the day the cataloging is done. At sometime in the future, the system will be modified so that all institutional-holdings information will be entered into the data base within seconds after cataloging has been completed.

Libraries have long had the objective of participating in the intellectual activities of its users. In small libraries it is possible for the librarians to know their collection in detail and to know their users as individuals. In this attractively human situation, the librarian can often participate in the educational, research, or informational activities of individual users. The same type of participation also occurs in intelligence agencies which are designed to obtain and communicate information to a decision maker before the decision maker knows the information exists. However, intelligence agencies have relatively few users, and in terms of number of users and amount of information processes, their expenditures are high. Of course, high expenditures are justified because of the extreme importance of the information.

The library lost the ability to participate in the educational, research, and informational activities of users as its professional staff grew in numbers. But cooperation based on computerization can make it possible for large libraries once again to participate in the informational activities of their users. Indeed, an exciting assemblage of techniques to achieve such participation is operating successfully already or is visible immediately ahead. In information processing, it is SDI services which have done most to demonstrate the ability of the computer to treat a user as an individual; SDI services have even demonstrated their value to individual librarians by enabling them to keep up with the publication of new findings in library research and development.

Computerized cooperation also makes

possible establishment of a new economic goal for libraries. Traditionally, the economic goals of libraries have been to design and operate efficient procedures that eliminate unnecessary costs. The technique is sometimes described as "saving money," but it is doubtful that any library has been able to reduce overall expenditures by improvement in the efficiency of its procedures. The inexorable rise in library salaries caused by rising living standards in the community as a whole causes an increase in expenditures despite economies of procedure.

This circumstance can be expressed as a rate of rise of per-student costs in academic libraries. In the past couple of decades, this rate has been 5 percent as compared with a somewhat more than 2 percent increase in per man-hour cost in the economy as a whole.² Until the advent of computerized cooperation, it was impossible for librarianship to develop a strategy which would decelerate the rate of rise of per-student library costs and to bring that rate in line with the rate experienced in the general economy. It is now clear that it will be necessary to invoke computer technology to increase continuously library productivity in order to decelerate the rate of rise of per-student costs. For the entire library population, it now appears that the only way that computer technology can be invoked is through the cooperative use of computers.

The highly efficient manual procedures developed by libraries in the past century have caused an imposition of uniformity that restricts the thinking of librarians about library processes. James Duff Brown, pioneer British librarian, detected as early as 1903, the deleterious consequence of uniformity when he wrote, "The hampering effects of too much uniformity are to be seen in full operation in France and the United States."³ A decade later, Brown exhorted the librarians of New Zealand

to avoid "paralysing stagnation." He went on to say, "One thing to be said for the standardized American methods of library management is, that they do produce a general level of efficiency, which, at least, assures an all-round mediocrity," and then pointed out that, "Standardization . . . tends to stifle all future progression."⁴

A simple and trivial example of stagnation caused by uniformity is the technique of employing unit cards in card catalogs. Such cards are uniform except for call numbers and entries typed on them. However, there is no need for tracings to appear on all cards, but until recently, many librarians accepted their presence in an essentially unthinking manner. With computerization it became possible to treat each card individually, the tracings need be printed only on specified cards. It has not been easy for many librarians to divest themselves of beliefs imposed by such simple uniformity, largely because until recently there was no opportunity to think about such a matter. Nevertheless, there are librarians who insist that the tracings should be on all cards largely because tracings have "always" appeared on all cards, at least throughout their professional careers.

Computerized cooperation will destroy the tyranny of uniformity which has more and more narrowly confined the effective imagination of librarians as librarians have increasingly imposed uniformity on their manual processes. Once again, a librarian can experience the delicious euphoria which springs from the creation of a completely novel idea which can be transformed into action. Once again, librarians will be able to function as intellectuals in the true sense of the word.

INSTABILITY

Cooperative librarianship does not, however, bask in the security of time-tested principles of organization, can-

not afford the false facade of self-sufficiency, cannot relax in simplistic techniques of communication and the low technology of typewriters, and is utterly destitute of qualified manpower.

At the present, there is no organizational design of choice for computerized library cooperatives. The Ohio College Library Center is a corporation made up of constituent members that are academic institutions, not academic libraries, in Ohio which have paid a membership fee for the current academic year. This type of organization has worked well for five years. However, it must be pointed out that it was the presidents of the institutions, not the librarians, who brought OCLC into being, and that the presidents and librarians had been talking and working with each other, off-and-on, for a decade and a half prior to the incorporation of OCLC in 1967. These two circumstances have certainly contributed to some extent to what appears to be organizational effectiveness.

OCLC's five years of experience is inadequate to warrant recommendation of its type of incorporation as a model. Other regional cooperatives should examine existing organizations and adopt a policy of eclecticism.

Some regional cooperatives have suffered difficulties in obtaining exemption from the payment of income tax. OCLC, for example, had to change its charter at the behest of the Internal Revenue Service to qualify for exemption. Other cooperatives have been unable to obtain exemption or have received only partial exemption. Organizers should be certain that the form of organizational structure selected will qualify the cooperative for exemption from income tax payments.

Computerized cooperatives should not presume to be self-sufficient, just as individual libraries, no matter how large or small, can afford such a presumption. Intrinsic to cooperation is recognition on

the part of an institution of the fatality of seeking self-sufficiency, and just as individual libraries should cooperate with each other so should regional organizations cooperate. Indeed, cooperation among regions will extend cooperation nationwide and internationally, and will enhance the availability of resources while at the same time will further reduce duplication of effort. In other words, cooperation among regions will further decelerate rate of rise of per-student costs.

Extension of cooperation among computerized regional cooperatives will not be achieved easily. First it will be necessary to design a complex, computerized interregional communication system in order to solve hitherto unsolved technical problems. There is no reason to think that these obstacles cannot be overcome, but it will take time and special competence to successfully eliminate present ignorance. Moreover, it will be necessary to establish some kind of a national library network agency to develop, operate, and maintain the network. The informal library networks of the past and present are completely inadequate for the immediate future.

On-line, computerized, telephonic communications employed by computerized cooperatives have no predecessors in classical librarianship. Hence, the new librarianship has an entirely new area of technology about which it must become effectively knowledgeable; such knowledge involves at least a smattering of telephony, an acquaintance with complex rate structures, legal restrictions, and telephone company policy. Unhappily, even a thorough knowledge of these topics cannot provide communication effectiveness because telephone companies do not have the necessary know-how and techniques to design and operate a large network without falling into an unknown number of self-designed traps into which the computerized cooperative is also catapulted. Only

knowledge, patience, experience, and excruciating pressure can yield a telephonic network operating effectively.

Similarly, librarians participating in the development and operation of computerized cooperatives must possess some knowledge of the operation of computers and of the characteristics of the world of computation. The extent of this knowledge must be sufficient to enable the librarian to understand the potential of the computer as well as the potential of libraries, for only by thoughtfully combining these two potentials can a librarian make a contribution to the new librarianship. Altogether too often library computerization consists of a computer programmer computerizing an existing procedure. Such computerization is tragically inadequate, for it exploits neither the potential of the library nor that of the computer.

A major source of instability in computerized cooperation stems from the fact that computer hardware which will be necessary to support cooperative systems in the foreseeable future does not presently exist. Dependence on others to develop the new equipment required for continued operation does not impart a comfortable sense of security to which librarians have long been accustomed. Nevertheless, computerized cooperatives can exist only by taking such calculated risks.

OCLC requirements for secondary storage memories furnishes an example of such a calculated risk. The OCLC on-line catalog is growing at such a rate that present equipment will, by early 1973 be inadequate for reasons of equipment expense and available floor space (file organization is entirely adequate to support a much larger file than present equipment and floor space can house). During the first third of 1973, OCLC will receive new, as yet unavailable, secondary memory equipment which will more than double memory capacity per square foot of floor space.

The equipment will be adequate for a year or so at which time still higher density memories are promised. When the file overflows this equipment several years hence, it will be necessary to obtain wholly new types of memories now in the early stages of development but not yet in operation except in purely experimental laboratories. Fortunately, there remain changes in file maintenance that can be invoked if the equipment development timetable slips further into the future than is now estimated.

Computer software contributes more instability to library automation than does hardware. Computerized cooperatives must attract the most highly qualified, imaginative, and effective programmers who can be located and persuaded to join the cause. Until recently, there has been no measure against which programmer performance could be judged, but by now, enough cost-beneficial library programs exist so that specific goals can be set for programmers. Incompetent programmers, of whom there are altogether too many, program disaster. One instance is known in which a catalog-card program producing unit cards required several hundred times the amount of computer processing as the OCLC program that puts out catalog cards in final form, ready-to-file. It is absolutely necessary that such disastrous programming be eliminated from library automation.

The highest obstacle in the path of evolving computerized cooperatives is the near total absence of librarians possessing an effective knowledge of computation and of system programmers with experience in designing and pro-

gramming complex, character manipulation systems. Librarians must be sufficiently and intimately familiar to be able to combine the potentials of libraries and computers into new systems. The technique of using truncated search keys to access the computerized catalogs as employed at the Ohio State University libraries and OCLC is an example of a type of catalog searching unfamiliar to many librarians.⁵ The prospect of computerized descriptive cataloging pushes the new librarianship a considerable distance from classical librarianship.⁶ To make effective decisions in the area of library automation, librarians must know much more about computation than they think they must know. The bright side of this dismal picture is the vista ahead, for surely part of man's greatest happiness is learning.

SUMMARY

The combination of cooperation and computation makes possible the establishment of new library objectives unattainable by individual libraries. Perhaps the most important of new goals is that of economic viability—a goal to which individual libraries cannot aspire.

Computerized cooperatives do not, however, enjoy the comfortable stability of classical libraries. Indeed, their instability, not to be confused with insecurity, can be a frightening experience for librarians. Moreover, librarians, as have physicians, engineers, and members of other rapidly developing professions, must redirect themselves to become perpetual students—an enterprise in learning that produces the most pleasurable of human gratification.

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