



Computerization: The Advent of Humanization in the College Library

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IN 1964, PHILIP MORSE astutely observed of libraries that, "When the collection grows beyond a certain size, or the users increase in number and range of interest beyond a certain degree, there seems to be a sudden change in the character of the library and of its service. The larger mass of material makes it hard for the user to find what he wants and hard for the librarian to keep track of the material, and the larger number of users and their wider variety of interests decrease the personal contact between librarian and user."¹ This paper is concerned with those college libraries whose numbers of volumes and users have enlarged to the extent that personal contact between librarian and user has ceased to exist for a high proportion of users. Indeed, this circumstance does or will exist for every library whose community of users continuously grows and changes.

As size of collection and user group enlarges, college libraries become monolithic arrangements of volumes, catalogs, and indexes. Ideally, books and journals should be arranged, cataloged, and indexed for an *individual* user, but as the number of users expands, it becomes increasingly difficult, and then impossible, to classify, catalog, and index for individuals. Instead, volumes are processed on the basis of content rather than for use and, except in the smallest of libraries, it is difficult to see how the collection could be handled otherwise. Nevertheless, this enforced disregard of individual users yields an intractably monolithic arrangement of materials that is depersonalized.

Fortunately for users, the electronic digital computer has immense potential for individual treatment of people and events. One major ultimate goal of computerization of college libraries must be the recapturing of humanization lost when libraries grew beyond the stage

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of having a staff of a single librarian familiar with all materials in the collection and able to interpret those materials personally for each user. To be sure, this goal may not be achieved until the end of the century, but it may not be achieved even then if it is not defined and established now.

The long history of machines reveals that one of their principal functions has been to enable man to enjoy increasingly his uniquely human attributes. Before the advent of machines, man was entirely occupied in the task of maintaining a biological existence and his cultural activities in art, faith, justice, and knowledge were so excessively primitive as to be almost nonexistent. Technological developments, in which machines have played a major role, have relieved man of the full-time occupation of staying alive, and have made it possible for him increasingly to enjoy his human qualities. It is the *human* qualities of library users and librarians which must be enhanced if library computerization is to be a success.

Although there can be no doubt of the enormous contribution which technology has made to human culture, there have been inhuman machine applications due to inadequate design by engineers and inadequate specification by managers. These inhuman applications are typified by designs that convert a human being into a segment of the machine to be driven by the machine. An example of such a misuse of machines is a pressman manually feeding sheets of paper into a power-driven printing press operating at a speed which is not under the pressman's control. Similarly, library computerization can unfortunately place requirements on librarians to perform machine-like tasks which machines, not human beings, should be performing. The computer's huge potential for personalizing the college library must not be marred by applications that dehumanize the staff.

The history of college libraries does not disclose them as humanized institutions. A century ago, American college libraries had but one function, namely, the conservation of books. College libraries were not growing rapidly and they certainly were not heavily used. In Ohio, the Library of Buchtel College, a precursor of the University of Akron, was open "at least one day of every week at such hours as may from time to time be appointed"²; Marietta College had 12,300 volumes which were available "every Saturday"³; Oberlin was open "on Wednesday, between the hours of one and two p.m., and Saturday, half an hour before Prayers, and at no other time"⁴; and Wittenberg

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with about 2,000 volumes was "opened once a week for the accommodation of students."⁵

During the two decades that followed the 1860's, American collegiate education began to evolve from the essentially medieval teaching practices followed a hundred years ago, and the American university began to come into being as a trainer of young men and women who could design and carry out independent research programs. At the same time, the library began to play a more active role in its institution and initiated service of information to students. As long as the library remained a one-librarian institution with relatively few users, it was possible for it to operate as a personalized collection. Dehumanization accompanied growth.

Four major developments in library organization and operation—all originating in academic libraries—facilitated use of growing collegiate libraries. In 1843, Charles Coffin Jewett, at Brown University, introduced subject indexing of books employing what is essentially the modern structured subject heading list. Five years later at Yale, William Frederick Poole introduced subject indexing of periodicals. A quarter of a century after Poole, Melvil Dewey devised the first effective narrow classification scheme. Originally intended for use in a classed catalog, Dewey's Decimal Classification was soon widely employed to arrange books on library shelves. Finally, in 1884, Dewey introduced the full-time reference librarian—two, in fact—at the Columbia University Library. Dewey's introduction of reference librarians came about because of his recognition of the monolithic character of book arrangement on shelves and entry arrangement in catalogs. He rightly felt that full-time librarians could greatly aid the user, and certainly it is the college library reference staff that contributes whatever humanization may exist in the modern college library.

Since Dewey's establishment of reference services in 1884, the one principal innovation in academic library operation has been the user-operated photocopying machine. In a sense, self-service photocopying increases personalization of the library, for it enables an individual user to obtain copies of only that information in which he is interested. Four out of five college libraries appear to have photocopying services⁶, and the monstrous number of photocopies produced testifies to the demand for personalized information service.

Forman has recently examined "Innovative Practices in College Libraries" and it is clear from his findings that radical extensive de-

partures from classical librarianship have not yet occurred.⁶ As for use of machines to increase humanization of libraries, little has yet been accomplished. It would appear that the most personalized innovative practice is Selective Dissemination of Information (SDI), for which a computer is admirably suited. An important one-fifth of college libraries have SDI services.

The results of Forman's investigation also make it clear that as yet there is no application of mechanization which significantly increases productivity of library staff or of users. For decades, library administrators have striven to cut costs by increasing efficiency of unit procedures; it has not been possible to increase productivity of staff in any real sense of that term. Moreover, college libraries are still largely self-existent institutions despite emphasis on service. As a result, some of the "efficiencies" which have been invoked have succeeded in lowering costs to libraries, but have all too often increased costs to users.

Because it has not been possible to increase the productivity of library staff, college libraries have experienced an exponential rise in per-student costs. During the first half dozen years of the 1960's, per-student cost increase was at the 5 percent compound interest rate. In other words, per-student costs of college libraries appear to be doubling every fifteen years. These exponential increases in costs, which have the same character as the per-student cost increases for colleges as a whole, are rising more rapidly and are basically different in character from the linear cost increases in the general economy, where salaries rise as productivity rises. However, in the economy as a whole, productivity rises because an innovative and improving mechanization effects an increasing productivity of each individual. As has been shown, productivity of library staff does not increase with salaries which must remain relatively abreast of salary growth in the economy. Or to put it another way, productivity of individual library staff members has not doubled in the last decade and a half as have library costs per student.

Currently, college libraries and communities of college students are growing more rapidly than at any time in collegiate history. As Morse pointed out, this growth enforces an increasing depersonalization on the library. Such dehumanization has been developing at an unfortunate time in collegiate history, for goals of collegiate higher education are focusing increasingly on production of a college graduate who will be a perpetual student. Indeed, it is difficult to see how an indi-

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vidual can make much way in the knowledge-based world of the immediate future unless he is a perpetual learner. Emphasis on teaching an individual how to learn, rather than on communication of knowledge, calls for educational experience to be an increasingly individual experience. If college libraries are to be successful participants in the educational programs of their institutions, some way must be found to return to the personal relationships which the one-librarian library enjoyed in the past. Here, it would seem that the computer offers the major hope.

Although fulfillment of that hope may not be obtained for another quarter century, it is important that the goal to be sought be defined now so that it can be reached along a direct avenue, avoiding distraction of wasteful excursions along detours and into cul-de-sacs. That goal for the college library should be a "library" which can organize the information it contains of interest to a particular user for use by that particular user. Of course, at the present time, no college library can afford to be organized for any one particular person.

Ideally, a college library should automatically reorganize itself for each individual user. Such a library is not outside the realm of possibility at the end of another quarter century, and the smaller the college library, the more possible the humanization. To achieve goals attainable by a computerized library, it will probably be necessary to convert to digital form information now in printed form. To effect personalized service, it will also be necessary to have efficient mechanized subject indexing and subject classification of information which the "library" holds. Major technical and intellectual problems require solutions before even the smallest college library could be automatically manipulated in a computer. First, it will be necessary to devise a mechanical technique for converting information in printed form to digital form. Mechanical conversion is absolutely necessary for several important reasons, not the least of which is that manual conversion of printed textual material in amounts equivalent to that in a college library would be a prime example of man's inhumanity to man.

At the present time, computerized subject indexing and subject classification of textual materials does not achieve the quality of human subject indexing and classification. Nevertheless, computerized processing is surprisingly good. There is no doubt that the not too distant future will see solutions to intellectual problems the lack of which currently prevents computerized subject indexing and classification from being equal to, or superior to, human processing. However,

to cope with textual materials in other than the English language, it will be necessary to have efficient and accurate machine translation. Here, the future is not bright, but it still seems likely that machine translation adequate for automatic subject heading and subject classification will be available before the end of the century.

The extraordinary college library of the future will not only be able to respond to each person as a person, but will also permit each user to remove copies of information with which he wishes to work while at the same time leaving on the "library shelves" the entire stock of information. In short, the college library at the end of the century will enjoy the attributes of centralization, and at the same time the qualities of the personal scholar's library of the nineteenth century. Of course, it is impossible to achieve this goal with traditional library techniques, but there is every reason to believe that computerization will enable achievement of such a goal in the next several decades.

The goal described above for the college library of a quarter century hence will not be reached suddenly at the end of twenty-five years. Rather, college libraries should evolve toward that goal, and an effort should be made in every library computer application to avoid a side excursion from the direct and broad path to the hope of the future. Initial steps toward that future goal are already behind us. Computerized SDI which some college libraries have activated is a major step toward the humanization of college libraries. Similarly, near-personalized computer-produced, selected bibliographies are a development in the direction of the future. Moreover, there will be segments of textual material in digital form in the relatively near future. At least two publishers are working on a computerized encyclopedia, and at least one has a pilot operation of such an encyclopedia. Initially, publishers expect to continue to print encyclopedias from computer stores which can be far more intelligently organized and updated than can the classical encyclopedia. Nevertheless, these publishers look forward to selling subscriptions to encyclopedias that will be in the form of remote access from some type of terminal.

So far this paper has emphasized future humanization of the college library for the user. What will be the effect on the college library staff? It has already been pointed out that computerization should not be designed in such a way as to increase mechanical behavior of library staff members but conversely, to relieve them of the many mechanical repetitive tasks now imposed on librarians. In short, human intervention in computer systems should be minimized, thereby free-

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ing staff to perform human intellectual tasks rather than machine-like operations.

After development of new huge file organizations in which to store machine readable catalog records, mechanized descriptive cataloging will come into being. It seems improbable that all tasks related to descriptive cataloging will be mechanized. Nevertheless, descriptive cataloging is largely a mechanical process in which a human being applies a complicated set of rules to data on a title page. When rules are precise, a machine can apply them, and with file organizations other than the linear arrangement of cards in a drawer, the rules can be simplified.

It will soon be entirely feasible for a cataloger to indicate by pencil marks on a title page, the main entry, title, and elements of the imprint; a typist, or keypunch operator, could copy the title page into machine-readable copy and include tags indicated by pencil marks. The computer could then format the title page information to appear like bibliographic information on a catalog card or in a citation, and place the entry in its file.

Here, the cataloger must place pencil marks on the title page and the keyboarder must copy the title page. Both tasks are mechanical although the former requires application of complex rules. Such a system could be criticized, particularly because of the inhuman use of a human being to copy the title page in order to convert it to machine-readable form. However, humans now do such copying so that the new system would not introduce, but rather would diminish, mechanical requirements placed on human beings. Of course, it is hoped that at some future date developments in optical character recognition would be sufficiently effective to relieve a human staff member from mechanically copying title pages. In general, staffs of college libraries can look forward to an increasing humanization of their tasks as computerization progresses.

The computer applications described above will require large sophisticated machines—larger and more sophisticated than colleges, much less college libraries, are likely to have, or be able to afford. Therefore, it appears most probable that a group of college libraries will share a regional computer, achieving access to the computer by remote terminals. Such sharing will make the computerization of college libraries economically feasible, and at the same time yield other benefits. For instance, duplicate descriptive cataloging would be eliminated since all catalogers would be using the same catalog file.

Similarly, the in-process file would be shared, and would be part of the main catalog file. With holdings recorded on a single machine-readable cataloging record, union catalog information would be available to each participant.

The most restrictive aspect of the college library card catalog is that there is only one of it, and users are forced to make a trip to the library (the larger the institution, the longer the trip) to consult a listing of library contents. With terminals in classroom buildings, laboratories, and dormitories, it will not be necessary for a user to go to the library until after he has determined that the library possesses the book and that it is available for him.

A direct benefit to colleges will be reduction of per-student library costs from an exponential rise to a linear increase, thereby bringing library costs in line with those of the economy as a whole. Exponential rise in per-student costs for colleges is without a doubt the most serious problem which confronts higher education today. It is not obvious how colleges can mechanize the technology of education to achieve desirable results which it seems that their libraries can attain in the foreseeable future. Nevertheless, if the college library can decelerate the exponential rise of per-student costs in its college, it will be making a major contribution.

In summary, it can be said that with increasing growth of a college community and college library, the library becomes a monolithic arrangement of volumes and catalogs that attempts to be all things for all users, but which disregards each user as an individual having his own personal interests. Sophisticated computerization of college libraries holds out the hope of humanizing these libraries before the end of the century. At the same time, library tasks will be increasingly humanized for the staff by relieving staff of machine-like activities.

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