GLYN T. EVANS
Coordinator of Library Systems
Five Associated University Libraries
Syracuse, New York

Summary of the Clinic

In this paper I want to indicate the significant elements in the papers and demonstrations given at this clinic and then speculate on some of their implications. The first significant fact is that there have been reports and demonstrations. Examples of successful applications of on-line technology to a variety of jobs which cut across the board of library operations–from acquisitions, cataloging and serials control, through two circulation systems, to the retrieval of biomedical information–have been heard and seen.

Further, each of the contributing groups were able to claim that on-line input and processing produced cost savings or cost benefits over batch processing. Everyone was, in general, happy with their systems.

One or two unresolved, perhaps unattacked, technical problems, did surface during the discussion. One was system size, or perhaps more precisely, file size. Fayollat was asked about expansion of his serials system from 7,000 to 70,000 current titles, and answered that he expected file arrangement and file access to be the critical problem with such an expansion. (Actually, it seems that check-in would be the big bugaboo.) Epstein, in answer to a question in the same vein, said that he would depend on Warheit; that is, he would expect technology to provide the answer. This reply caused some amusement, but Epstein may not be far wrong in his attitude. Certainly thus far history has been on his side. At the 1972 Educom Spring Conference, an account was given of the progress of the development of the first trillion-bit laser memory and the peripheral equipment which must surround it, which is expected to be delivered to the ARPA network shortly. However, how long technology can stay ahead in the game of logical optimum file construction is an open question.

Other technical problems mentioned were transferability, file security, downtime and back-up systems, all of which I will refer to later.

The first, exciting lesson of this clinic is that on-line library automation is now technically feasible. Another aspect of the clinic was provided by its last speaker.

I have been intrigued by an interesting rivalry in innovation among conference organizers, a phenomenon which has manifested itself in strange ways in recent years. It started, to the best of my knowledge, with the Medical Library Association in New Orleans in 1969, with the superb Olympia Jazz and Marching Band, smuggled in under the guise of a lecture entitled "New Orleans Funeral Music—A Dying Art!" The 1970 ASIS Conference at Philadelphia countered with Middle Eastern music, and quite the most beautiful belly dancer I have ever seen for which I am forever in their debt. This clinic, with studied calm, gives us Ellsworth Mason.

Mason is a brilliant performer. His enviable command of language, his elegant turns of phrase, the dismissive wave of the hand, his unremitting rhetoric, bedazzle and bemuse us to our—and his—loss. For his supporters are hypnotized by the silken glitter of his top hat as he soft shoes his cane-twirling, spats-twinkling, white-spotlit way across the stage. And his opponents, infuriated and goaded, attack the shadow of his cape and not the substance of his argument.

The result of this kind of encounter is a trivial event. Supporters, roaring from the gallery, applaud, unfeelingly and insensitively, at the wrong moments; while the opponents are always one step behind the nimble hoofer. Mason's performance at this clinic was no different, and the attempts at rebuttal, with one or two honorable exceptions, fell into the well-laid trap. And the undeniable brilliance of the spectacle obscures the game, more's the pity, for there are real issues at stake.

Mason rather gives the game away in the second sentence of his paper when he says that computerators "do not dare to think about the basic problem which it [the computer] poses to librarianship." There is no evidence that the computer threatens bibliographic procedures or records, indexes or abstracts, reference services, accounting systems, book publishing and the thousand other areas in which it affects the daily activities of librarianship. Indeed, many of our tools could not exist without the computer.

The computer does, however, pose problems to the library administrator who, already burdened with uncertain budgets, staff problems, inadequate buildings and an almost total lack of real planning, is reluctant or unable to introduce one more variable into an already impossible situation. Of *course* someone was going to lash out in sheer frustration. At least it is merciful that the inaccuracies and woeful misconceptions, exaggerated though they be, were presented by Ellsworth Mason with eloquence. The tragic irony is that at precisely the moment when the breakthrough is being made, misguided attack could damage hard won achievements and jeopardize, not further development, but massive implementation and exploitation.

Having said some things which may be disagreeable to Mason, I will now attempt to please him by saying that two parts of his message are absolutely right. These are that new systems have to be cost beneficial, and that group development will probably produce the highest yield from investment.

Cost Benefit

The new on-line systems must be cost beneficial to the libraries which use them. The central issue facing libraries today is survival. Libraries must move from being a labor-intensive, capital-intensive economic system. For a forceful presentation of this proposition see the papers of the National Commission on Libraries in *Libraries at Large* and Kilgour's article in *American Libraries*.[1]

Four outcomes to the installation of a new system should be considered: (1) a clear financial gain, new vs. old, (2) cost break even, new vs. old, (3) greater expense justified by improved service, and (4) greater expense not justified by improved service. Of the four, the last is clearly unacceptable. An even cost break, (2), is a neutral situation where a decision is governed by personal predilection.

The clear financial gain noted in (1) will presumably override other considerations. (I assume here that the standard of service remains even, if it is not an actual improvement.) Fayollat, for instance, was able to report a clear dollar saving for the UCLA Biomedical Library.

The difficult case is (3), where a greater expense has to be justified by improved service. Both Ohio State University (OSU) and Northwestern University's circulation systems reported dramatic increases in the number of transactions–31 percent at Northwestern; and OSU reported that its costs are now even with what they were before it installed the system; nonetheless its circulation has increased over 40 percent. Much of this increased service occurred before recent budget changes increased costs to their present even point.

Cost benefit analysis in libraries is almost nonexistent. Libraries have lagged behind management and industry in developing methods for assigning value to the benefits of improved service. I was told the other day of a cost benefit study which concerned the search for a power station site. One of the sites under consideration would have affected an existing ski slope and resort area. The cost benefit analysis attempted to account for any interference with the skiing by measuring such factors as the amount of play time spent on the slope by skiers, the investment in equipment by skiers, the investment in equipment by ski slope developers, and the value to the community of the availability of the skiing facility. The outcome of that cost benefit analysis is not important for this discussion. What is important is the fact that the planning authority was prepared for, and felt that it had the tools to perform, such an analysis.

All of the systems reported at this clinic claim some extra benefit, such as improved control, better management information, and so on. The most unexpected claim was Miller and Hodges' report that an overwhelming benefit was the development of a team planning attitude in the total organization. Clearly, this last is an enormous benefit, and it should be possible to place a dollar value on the benefit as decisionmaking within the organization improves.

In general, however, we in libraries do not know how to measure the cost benefit of improved service. I submit that we have to develop some understanding of the problem as we encounter increased competition for dwindling resources. We should be able to face management with confidence in our own calculations when we seek funds. When Atkinson was asked if his budget and credibility had increased as a result of the system, he answered, "credibility, yes; budget, no." He surely is heading in the right direction though.

Modes of Implementation

There are a number of ways in which libraries can acquire the benefits of on-line service. They can develop it themselves; they can participate in joint development; they can link into an existing development which is capable of and prepared to accept expansion; or finally, they may be able to exploit existing facilities to their particular advantage.

Let us take the last case first. There is a small library situated on a large research reservation which found available an elegant package of text processing and retrieval programs maintained for the on-line access of its own research community by a central computing facility. By utilizing this package the library was, within a few days and at no capital cost to itself, able to develop a library system in which current acquisitions from all sources were entered onto the file via terminals, and a variety of outputs were produced, including catalog cards, announcement lists and KWIC indexes. The system has the capability of expanding into an abstracting service, with Boolean text search facility, whenever the library feels that it is able to take advantage of these modules. The cost to the library is maintenance cost only. It is clear that, as on-line networks develop, more libraries can exploit such situations *if* they are alert to the possibilities which present themselves.

One approach is to develop the system for one's own library. There have been accounts of different attacks on this problem during this clinic. Miller and Hodges discussed their adoption of the IBM package FASTER; Auld and Baker reported on a computer system which developed its own operating system. Atkinson contracted IBM to do the job. I do want to draw attention to a statement by Auld in which he warned that locally developed software is a major undertaking, particularly if it means playing with operating systems. As the number of networks increases and our understanding of networks improves, the unique library-developed on-line system will become the rarest example of on-line development.

The next case to be considered is that of the library or consortium which links into an on-line system which is capable of expansion. Pizer presented a map of the Biomedical Communication Network (BCN) and told about the growth of the National Library of Medicine's Medline system.

The Five Associated University Libraries (FAUL) and the New England Library Information Network (NELINET) are two consortia which have been fortunate in being able to pursue this course of action. Both FAUL and NELINET are presently negotiating agreements under which they will link into the Ohio College Library Center (OCLC) system by the direct terminal hookup of their member libraries. This is seen to be an interim step prior to planning the eventual replication of the OCLC system in their respective regions and the direct linkage of three major computers. The advantages of this kind of arrangement are obvious. In the short term, the incoming consortia will avoid the heavy development cost of building the system themselves, and yet their usage of the system will significantly reduce costs for the original members. The long-term advantage is even more important.

I believe we are witnessing the birth of a national on-line bibliographic network, particularly since it seems possible that the system may expand beyond OCLC, FAUL or NELINET. The prospect of, for example, Ohio State University, Yale, Cornell, University of Pennsylvania, and Dartmouth sharing and contributing to the same MARC data base is exciting, to say the least. A similar growth situation is taking place at Stanford as Epstein and Veaner related.

The characteristic which underlies the expansion of these systems is that it is possible to demonstrate the potential for clear cost savings. Both FAUL and NELINET performed internal feasibility studies before making their decision to seek formal relationship with OCLC. The published cost studies on the expansion of the Stanford BALLOTS system network performed by Eleanor Montague are a model of their kind.[2]

Finally, in modes of implementation, we have to look at the joint development of on-line systems. Probably the most successful example of joint support for such a development is the OCLC system. The Ohio College Library Center has been running its on-line shared catalog service, including the submission of original records in MARC II format by member libraries to the central data base for the common good, for a year. The sharing of costs and expertise in a successful system development project is clearly very attractive to the participants in such a venture.

Consortia

The present economic situation points to the joint development of such systems. Library consortia can provide both the necessary financial base and an adequate resource of expertise, but the development of a consortium is not

an easy undertaking. The human problems which can be encountered must not be underestimated. The consortium must have a clear mission, and objectives which are understood and accepted by all. Program priorities must be assigned which will certainly not suit every participant. The consortium members need to have patience and courage; results cannot be expected overnight, while uninformed criticism comes easy. The difficulties must be assessed realistically and adequate funds provided.

We have to face the fact that no one library is strong enough to do this alone and we must be prepared to work cooperatively. Institutional pride is vital to any organization, but common sense must prevail and a reluctance to seek and exploit any opportunities to better serve one's institution is a disservice to it. Enlightened institutional awareness is better than misplaced institutional loyalty.

Standardization

Pizer devoted a section of his paper to standardization—a concern which immediately emerges when considering cooperative on-line library technology. Standards apply in a variety of forms—standard data, standard formats, standard outputs, and standards of service—and are essential if systems are to be transferred or replicated.

A standard format is an absolute necessity for the interchange of data. Libraries are indebted to the Library of Congress for the MARC formats and the distribution of data in that format. Standard data is harder for librarians to accept, wedded as they are to old practices and traditions. I am impressed that OCLC, when faced with either forcing total acceptance of data or facilitating easy modification of data through an on-line system by its members, chose the latter course. Some essential changes do have to be made to records before they may be accepted locally. As Kilgour states, "Uniformity [is] a requirement by which libraries have never been able to abide. . . . Uniformity and standardization are not synonymous."[3]

At the same time we have to recognize that making such changes costs money. Careful thought should be given to the question of which elements in a record should be changed, and what will be the real effect of such changes on the library operation. For example, a recent internal study performed at the University of Rochester examined the effect of total acceptance of LC class numbers on shelving.[4] It was found that 61 percent of books would be shelved in the same place, 13.5 percent would be between one and three places off and 20 percent more than three places off. A subsequent smaller study on the final 20 percent showed that (in class N) 70 percent would be within twenty places, or on the same shelf. In other words, (with the exception of classes P and Z) acceptance of an external data source might not be as damaging on reflection as it seems at first.

This brings us to internal standards of service vis-à-vis on-line cooperative systems. David Kaser stated the problem clearly when he wrote "Some [libraries] would in certain operations have to raise their individual standards to those adopted by the group, and that costs money. In other operations some would have to settle for lower standards, and that is expensive in its impact upon institutional pride, dignity, and morale."[5] Librarians will have to face a complete reexamination of their standards for both records and services. The new technology presents this opportunity since things undreamed of by our predecessors can now be done as we realize that many articles of professional faith are really statements of temporal expediency.

Finance

I remarked earlier that we are entering a phase of massive implementation. The difference between possible and feasible is precisely the difference between an intriguing research task and a successful, attractively priced system. A number of the systems reported on at this clinic clearly fall into the latter group, but their consolidation and expansion demand a high level of capitalization.

What are funds needed for? We will need to run the systems for some time, perhaps two or three years, before we can claim anything like maximum savings, or before they break into a cost-benefit mode. Meanwhile, terminals have to be bought, computers and telephone lines leased, operating staff hired and changes made in existing procedures, all of which costs money. Federal agencies, state and local governments, grant foundations, and parent institutions should be prepared to support this revolution in technique.

Librarians as managers of their systems should have as much confidence in their requests for capital and their ability to deliver on investment funds as they as individuals have when they approach a bank manager for a mortgage. Of course this may present difficult problems in the internal accounting structure of many organizations but such a condition should not act as a deterrent to change. Requests also presuppose efficient cost-benefit analysis.

There is one other significant area in which federal funding in particular should play a major role, and that is in the development of major data bases. For instance, it is, to put it mildly, a disappointment that there is still no major machine-readable data base of standard serials catalog data, particularly since the absence of such a resource will clearly retard the development of on-line serials control systems. Such data bases should be created as expeditiously as is possible.

While discussing finance I want to refer to one of the recurring questions which appeared all through the clinic—the problem of downtime and back-up systems. It is important that we realize that these problems are, in general, of financial rather than technical origin. We just cannot afford to run a second

complete computer and communication system as back-up to the first so that it automatically kicks in when something goes wrong. To use a simple analogy, it would be like towing around a second car in case the first breaks down. Only space flight can afford that kind of technical duplication–and perhaps only space flight needs it. Rather, we have to do the best we can to prevent failure by good system design, and to minimize the effects of failure when it does occur by protecting files and data.

People

Before we get started with the available technology, the human aspect of the task must be considered. First, as librarians try to convince administrations both inside and outside libraries that they deserve financial support, they also must convince their professional colleagues. Libraries are facing problems. One reasonable solution to some of the problems is on-line computer technology. Librarians are reasonable people and are prepared to accept reasonable solutions. (I use the word reasonable to mean based on "reason" or "sound thought and judgment," rather than merely tolerable or acceptable.) They have a responsibility to present the answers in such a way that they can be understood by the profession. They should not shrug this off as an unworthy exercise, since the failure fully to understand the new technology will surely wreck our efforts. If clarity of thought and felicity of expression can prevent sabotage of systems, librarians should seek them.

Second, librarians have to recognize that cost savings will come largely from the personnel budget, which presents a human problem. After 150 years of industrial revolution librarians should know enough to be able to solve the problems of staff retraining and reallocation with humanity and patience. Decisions on how to achieve the essential savings will be necessary, and I hope that normal attrition is a strong enough tool. I do not believe that librarians are Luddites who will destroy machinery. Librarians must consciously decide that the necessary changes will be implemented with compassion; on the other hand, as a profession we cannot respond with blind, unreasonable opposition to measures which will save libraries.

There is a logical alternative to clumsy staff reduction, and that is not less but more librarianship. For example, the present bibliographic description is at best a poor tool which librarians should be prepared to augment and enhance with analytics and better subject description. The art of subject bibliography barely survives since so much of our time is taken with routine procedures. But this alternative requires that funds realized by savings made through the enlightened use of technology be used to enhance the services offered to the user, an action which must be presented to the administrator with cogent argument and firm cost-benefit projections.

Total System Service

Finally, I want to look at the future which Warheit denied himself in the excellent paper which opened this clinic. In the papers which have been presented there are some clues as to the final shape of the on-line systems which will be used by libraries. I believe that we will eventually see, in the center, an arrangement of very precise task-oriented files, made up of very short records of carefully selected data elements being used to perform the housekeeping functions of circulation, acquisition, fiscal control, serials control and, probably, the shelflist. Surrounding and supporting these will be the major standard, almost static (once a record is established) files of full bibliographic description which will support and supply the volatile task files. Further out will be the files of indexes and abstracts which will be searched either currently for selective discrimination of information or retrospectively for or by the library users, and which will also link into the center files to provide location and availability information, and, perhaps rarely, to the middle circle for bibliographic data.

The remarks made by Atkinson on the feeding of the OSU on-line shelflist for circulation purposes by OCLC tapes and the way in which BALLOTS is expected to develop, clearly point in this direction. Pizer's account of the proposed interlibrary loan module of BCN attacked the problem from the other direction. The work being done at Syracuse University, not reported at this clinic, also points this way.

I have talked throughout this summary of funding for implementation, but the research is not yet over. Rather, it may soon be moving into a phase of synthesis as the discrete building blocks are joined into a comprehensive system, and the need for adequate funding for research is just as urgent. But I believe that the systems which are presently available and the quality of achievement which they represent should give librarians confidence as they seek support.

On-line library systems have moved from being technically possible to being technically feasible, as we have seen demonstrated both at this clinic and by other workers in the field. If we can continue in this direction we can develop a total system of service which is aimed at a vastly improved individual service for the user and an efficient operation for the library.

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