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ABSTRACT

The May 1971 issue of "College and Research Libraries" featured an article by Dr. Ellsworth Mason which constitutes an all-out attack on the application of computer technology to library systems. Dr. Mason views the computer-based technology to library systems developed to date (at least the ones he has studied) as unqualified disasters from a cost benefit point of view and librarians who have made the decisions to implement them as naive, incompetent and hypnotized by the siren songs of the computer industry. In conjunction with the American Library Association Conference in Dallas, Texas, The Library Automation Research and Consulting Association (LARC Association) arranged to hold an informal discussion of Dr. Mason's charges. This paper presents excerpts f the proceedings. (Author)

ARE COMPUTER-ORIENTED LIBRARIANS REALLY INCOMPETENT?

EXCERPTS FROM THE PROCEEDINGS OF A LARC MEETING

HELD DURING THE ALA CONFERENCE

IN DALLAS, TEXAS

JUNE 24, 1971

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INTRODUCTION

The May issue of **College and Research Libraries** featured an article by Dr. Ellsworth Mason, Director of Libraries, Hofstra University, which constitutes an all-out attack on the application of computer technology to library systems. Dr. Mason views the computer-based technology to library systems developed to date (at least the ones he has studied) as unqualified disasters from a cost benefit point of view, and librarians who have made the decisions to implement them as naive, incompetent and hypnotized by the siren songs of the computer industry.

In conjunction with the ALA Conference in Dallas, Texas, The Library Automation Research and Consulting (LARC) Association arranged to hold an informal discussion of Dr. Mason's charges. The meeting was held Thursday, June 24, 1971, 6:30-8:30 p.m. in The Civic Room II of the Adolpus Hotel. Dr. H. W. Axford, Director of Libraries at Arizona State University, and Allen Veaner, Assistant Director for Bibliographic Operations, Stanford University, served as commentators and moderators. The following are exerpts of the proceedings.

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EXCERPTS FROM THE OPENING SPEECH

BY

DR. H. WILLIAM AXFORD

Exerpts from the opening speech by Dr. H. William Axford, Director of Libraries, Arizona State University, Tempe, Arizona

I have only a few remarks to make, and I'll try to keep them short and to the point. I'll begin by commenting on the three basic points that Dr. Mason stressed in his article. They are:

1. that librarians have demonstrated considerable naivety with respect to costs and complexities involved in designing and implementing computer systems.
2. that there is a strong tendency to believe that just because something is technically possible, it is always desirable.
3. that because of these factors there has been a misapplication of funds that have been put into the library administrator's trust.

These are serious charges and we cannot deny that there have been projects to which resources have been allocated which have not produced the desired and hoped for results. But, Dr. Mason has utilized a kind of Philip Wylie approach to make this point. He has gone beyond a criticism of the cost benefit ratios of individual projects he studied to blanket condemnation of computer technology itself. If I wanted to go out on a limb, I could take a counter position by noting that the amount of money that is wasted each year on useless, expensive, and outmoded manual procedures far exceeds the dollar outlay of every computer-based system that has been implemented in the libraries in the United States. This, however, is not an argument that can be used to refute Dr. Mason's views.

A major contribution of the computer that Dr. Mason has failed to note is the fact that like it or not it has forced librarians, at least those contemplating its use, to undertake a critical examination of manual systems. This fact alone has resulted in considerable streamlining and improvements, and, consequently reduction in cost. On the other side of the coin, one cannot overlook Dr. Mason's observation that the computer in hands of the naive or unknowledgeable has the potential to turn a relatively minor problem into an utter catastrophe.

Dr. Mason tells us that the high costs of equipment and personnel simply do not make computer applications feasible in libraries, and he stresses that the transfer of library programs to computer systems is neither feasible now nor in the future. But, he fails to give us any documentation to support these statements. As a matter of fact, such documentation does not exist. As for the transfer of library programs, one may cite numerous examples where a library administrator has moved from one institution to another, taken the computer man and all the systems, and put them into operation at the new institution without a great deal of difficulty. In most of these cases the systems involved were not prestigious enough to come to Dr. Mason's attention.

Dr. Mason's charges will, no doubt, be discussed by librarians for months to come. In his favor, it can be said that they are bound to stimulate a critical self-analysis that has long been needed. But, many of his charges simply have no foundations at all in reason or in fact. Indeed, he seems, at times, to have assumed the role of the crusader motivated by a fiery faith and whose major goal is the expulsion of the infidels from the Holy Land.

A REPLY TO DR. ELLSWORTH MASON

BY

ALLEN B. VEANER

DALLAS, TEXAS

JUNE 24, 1971

Excerpts from a speech by Allen Veaner, Assistant Director for Bibliographic Operations, Stanford University.

The announcement that was circulated about this meeting referred to a 'storm of controversy' surrounding Dr. Ellsworth Mason's article in **College & Research Libraries**. I would say that these reports are exaggerated. I haven't encountered any 'storm of controversy'. Some people I have talked to have responded with a sort of quiet amusement. Some, like myself, selectively agree and disagree. I do agree with a substantial number of points that Dr. Mason has made. Some of my agreements are enumerated in an article, "Major Decision Points in Library Automation," which was published in the September 1970 issue of **College and Research Libraries.**

I agree with Dr. Mason's contention that the computer is an element of great instability. Hardware is always changing, and the overall rate of change is staggering. We are in an era of extremely rapid change, and we haven't figured out how to deal with it. But this failure cannot be attributed in simplistic fashion to the computer alone. We are passing through a wide ranging and complex social and technological revolution. The computer is just one of the forces for change. Scolding computer people and cursing the computer is not going to solve the problems or make them go away.

The second area of agreement is that the future in libraries lies with managers who can make the most of every cent available. But, in this regard, the availability or the unavailability of the computer is totally irrelevant. What is really important is the management of resources — dollar resources, people resources, computer resources, intellectual resources. We have heard over and over, but somehow we refuse to believe it, that the computer is merely a tool and not a miracle making device. The computer is only going to do what we tell it to do. To make it perform according to our desires requires management techniques. Unfortunately, some librarians haven't learned much about management techniques in the past half century. Some have been busy splitting hairs or straining at gnats, deciding whether to use a semi-colon here or a comma there. In this past devade, instead of learning ten cumulative years of management experience, we have repeated one year's experience ten times. This, of course, is not unique to the library world. But it is costly, and our resources are extremely limited.

The third area of agreement concerns expectations. Our expectations for library automation have been raised to unprecedented levels by computer scientists, by salesmen, and even by our colleagues in the profession. All parties in library automation have at one time or another been guilty of oversimplifying the problem. I am certain that this overconfidence or task underestimation is now a thing of the past; at least among informed and experienced computer scientists one no longer hears that the library problem is "trivial." Part of the difficulty has been poor communication between the several talents needed and lack of common language. At the humorous level, one finds that when the librarian talks about the "main entry," the computer man starts looking for the front door of the library. Fortunately, through improvements in our library science curricula and the development of information science courses in our major universities, we are now training people who can talk to each other.

I turn now to a middle ground of agreement and to areas that Dr. Mason did not touch upon.

First, the need to define goals and objectives. Dr. Mason fails to acknowledge that librarians rarely express their goals and objectives with a clarity and explicitness that lends to easy communication. In the computer world, anything that is not explicit, anything that is ambiguous, cannot be programmed. Likewise, anything that is constantly undergoing change cannot be programmed, and anything that is not expressed quantitatively or in symbolic logic is not compatible with computer based systems. As librarians, we have often failed to define our goals quantitatively and cannot provide the kind of statistical data that a system designer needs.

Let me now deal with areas of serious disagreement between Dr. Mason and me. Dr. Mason based his findings on visits to ten institutions. Yet there is a lot more going on around the country. For example, The University of Chicago, a center of advanced research and development in library automation, was not one of the places he visited. There are numerous successful applications that he failed to mention or ignored completely. The Ohio College Library Center has a very successful card production system based on MARC tapes. Another, is the New York Times Information Bank that is about to become operational. There is the Ohio State University circulation and book information systems that represent a notable extension to traditional library services, and would not have been possible without the computer. What about Northwestern University's self-service book charging system? The Harvard University circulation system and the Harvard shelflist conversion project have been in progress for many years, as has the University of California Union Catalog Supplement project.

Dr. Mason begins his article by referring to a small library with a peak circulation transaction load of 700 charges per day. He says:

'On an evaluation visit last spring to a small college (collection 175,000 volumes, peak daily circulation 700), I found the library automating its circulation records, an action tantamount to renting a Boeing 747 to deliver a bonbon across town. Everyone felt great about it; it was a Good Thing! In a college sorely pressed for funds, wasting this amount of money was actually a serious crime against the common weal.'

I think this example is ill chosen. Seven hundred transactions a day is not a small load. It is really 1400 transactions — 700 charge outs and 700 discharges. To which one must add inquiries into the files, plus overdues, plus statistics. Then there is filing. Indeed, there is a lot of work with 700 transactions a day. If someone can find a good way to do this by machine, why shouldn't it be a Good Thing! But what was the **average load** in this institution? Dr. Mason does not tell us. Perhaps that's not so important — we all know manual systems have next to no reserve capacity and cope poorly with peak loads. I know a very effective, and quite economical, automated circulation system in a small college library in Colorado. The users are quite pleased; the management is quite pleased. Why shouldn't they automate? They have no more filing to do, no more overdues to write out by hand, no photocopying or stuffing envelopes. All these things are now done mechanically. During their first year of operation, they failed only twice to get a computer printout for charge out purposes. That is an impressive performance.

Nowhere does Dr. Mason mention the numerous MARC applications. For example, the SDI system at the University of Sasketchewan, the services provided by the Oklahoma Department of Libraries, the in-house services at the University of Chicago and Columbia, Information Design's CardSet system. And there is the very effective service provided by the British National Bibliography where MARC Tapes have been merged with BNB tapes and printed out in human readable form on microfiche such as I have here in my hands (demonstrates fiche). An entire year's worth of MARC tapes can be held on five fiche.

Dr. Mason fails to touch upon the utility of automation in promoting standardization. Two years ago, in a speech at the Atlantic City Conference, I quoted Herbert Putnam. In 1900, while introducing the Library of Congress' card service to the nation, Mr. Putnam expressed his elation with this new found source of centralized bibliographic data. He thought it would eliminate the duplication of cataloging effort. How far have we really gotten in standardization in the past 71 years? How far have we come in the 100 years since Charles Jewett proposed to make the Smithsonian Institution the national bibliographic center? We really haven't made much progress. Now, two-thirds of a century later the catalogs in our largest libraries have grown to unmanageable size. Editorial costs for the next quinquennial of the **NUC** are estimated to exceed one million dollars, and production of this invaluable tool continues to be carried out manually by methods that bring the **NUC** out at ever slower rates. Our major bibliographic services — the printed **NUC** and the printed LC card — have both passed the limits of manual systems for management, production, and distribution.

Dr. Mason fails to tell us that MARC may be the greatest single influence we have today in promoting badly needed standardization. Without greater emphasis on standardization, we are not going to get any place — manually or mechanically. We will be overwhelmed by economic forces. I ask Dr. Mason: In an era of labor militance and growing unionism, of increasing demands from users, of growing workloads, of static or reduced productivity, of inflation, etc., where are we going to get the money required to maintain manual systems? I would like to know the answer to that question.

At the top of column 2, page 184, of Dr. Mason's article, he claims that the computer is "not subject to reasonable surveillance."

'. . .Unlike most other machines, the computer is not subject to reasonable surveillance at any level of operation. A college president or the manager of industrial research cannot judge with any reasonable degree of accuracy how much computer capacity is required for his needs, nor can his subordinates. This means that basically he must accept his computer configuration on faith and on the urgings of computer industry representatives.'

This is not true. The well managed installation maintains careful utilization records, and keeps a constant surveillance on how resources are distributed, how load and demand is distributed, and what's available at any given time. Dr. Mason is simply telling us that there are some poorly managed computer facilities. Of course there are — just as there are some poorly managed libraries. But that is no reason to throw out the baby with the bath!

On page 185, the bottom of column two, he says:

'. . .But when we used the computer, it didn't save staff, and it didn't speed processing, and it cost a great deal more to do the same things we are doing by hand. Our reaction was to computerize more. Although we lost money on every operation we computerized, the theory grew that if you knit enough losses together, obviously you would save money.'

One problem with computerizing is that libraries do not always do the same things they did by hand. They do some new things, and, of course, they do some more of the old things. Anytime you have a more powerful tool in your hands, you are going to do more things than you did before. For instance, when the man of the house buys a saber saw, a rotary saw, and a planer, he is going to end up buying more lumber than he did before he had them — and, as a consequence, his budget at the end of the month is going to be bigger. When Xerox equipment began to displace the conventional photostat. there was an initial reaction that the photocopy budget would go down because Xerox was so much cheaper. Well, what happened? The per copy cost is now many times lower than with the old equipment, but the photocopy business is 40, 50, perhaps 75 times bigger than it was. We've all got used to copying loads more paper, more than we ever dreamed of in the old days. And as a result our whole way of working has changed. Dr. Mason is caught in a trap of thinking that just because something is more economical on day number 1, it should still be less costly on day number 100. Is there anybody in this room who would actually be willing to return to the old photostat days? Is there anyone who can identify a computer application that does exactly what its manual predecessor did and no more? If there is one, it can almost be defined as a poor computer application. It shows that no new thinking was applied to the problem.

On page 186 of Dr. Mason's article, he infers that the computer is a useless machine that can only be meaningful if the manufacturers provided a program that we could simply insert.

'. . .It is a half-baked machine. Every other kind of equipment we use is bought for specific purposes, to perform defined tasks, at a known cost. Even highly automated equipment like the MT/ST comes with a simple program to perform known tasks after a modicum of training. A wholly baked computer, nicely browned, would be ordered to specifications. and would come ready to dust off, to insert the program provided by the manufacturer to do what we wanted to be done, and to begin our computerized operation. Only under such conditions would we consider any other machine. But we have been brainwashed not to apply the same reasonable standards to the computer. The cobra has us hynoptized.'

That's a good idea, but how can the manufacturers provide canned software as long as there is no national agreement on what we want done? No manufacturer can provide software for a specific user to do things his way because his library is "special." How can manufacturers work from such premises as . . . **'I know they do it that way at L.C., but we have to do it this way in our library' . . . or, 'we have to format our call numbers this way because our users don't understand call numbers as they are printed on L.C. Cards.'** If we asked the marker to provide us with software using premises like these, he can only conclude that we are stupid. Let's be realistic: as long as we can't specify explicitly, in a uniform and exact way, what we want done, there is no way we can get canned software. To each unique application there must correspond a unique set of programs, subroutines, etc. No manufacturer or software house in its right mind would undertake a contract to please everybody; it cannot be done any more than we can get custom tailoring at mass production prices.

From still another viewpoint, a system designed by a hardware manufacturer for a library seems to me doomed to failure from the start. That is designing a system for the user but not with the user. Any system, whether manual or automated, must belong to the people who use it. It must interact with the mind or the brain. Besides, bibliographic products and services are the result of human intelligence at work; these products and services can only come through the guidance of experienced, capable librarians. We are not going to get bibliography from the computer makers. They are basically in the "electronic machine tool" business — it is up to us to determine how these tools shall be used. To date we have not made that determination — that is why we cannot have canned software. This is not to say that we shall never have manufacturer provided software for bibliographic applications. I simply do not see it in the immediate future because of the diversity of bibliographic standards and practices.

On page 188, Dr. Mason complains that in a circulation system, a delay of one day can effect the ability of circulation files to account for the location of a charged book.

'. . .Response time of computers, which is incredibly fast, is not to be confused with the response time of computerized processes. It is common knowledge that computerized class schedules take weeks longer to produce than the old hand method. In librarianship, these are some of the commonplace delays found strewn all along the trail: Circulation, a delay of one day in the ability of the circulation file to account for the location of a charged book (in one case, the cost of paper led to updating the file only once every three days).'

How many manual systems provide services much better? How many libraries get their charge slips into the files instantaneously, especially under peak load conditions? Many manual systems do not provide one day turnaround. He fails to mention the value of additional records that can be produced by the computer, or the value of eliminating many laborious, error prone procedures. Relieving the staff from dull work is certainly a value.

On page 189, Column 1, Dr. Mason comments on the compatibility factors from one generation of computers to another.

'. . .The Fourth Truth — Well, anyway, once you have done it, thou shalt have economies in future programming by having programs convertible to later generation computers. . . . Absolutely false! About half of the third-generation computers in major industries are in an emulation mode that makes them perform as second-generation computers because industry, having been hooked on the enormous programming costs for the second generation, is unwilling to absorb even higher costs to program for the third generation, which leads to an interesting view of our economy (like our libraries), buying the latest to get with it to avoid losing face.'

Dr. Mason does not document his claim that half the third-generation computers in the nation are working as if they were second-generation machines. It seems doubtful on the face of it at this stage of computer development, when we have already entered the "3½" generation. As for transferability, that is a problem not peculiar to librarianship or library applications of computers. Actually, very few large systems are transferable in any sense because of their incredible complexity. No matter what degree of commonality dominates the library profession, no manual system is completely transferable from one environment to another without a substantial and expensive "cut over" cost, plus a great deal of convincing the people at the operational level of the merit of the change. It is **people** — not machines — that make or break the transferability of a system, whether of a manual or an automated one. In any case, absolute statements do not help us understand the problem. Suffice it to say that **programming** transferability for large systems is not realizable at this time; **system** transferability may be realizable in the presence of talented and dedicated leaders. Nevertheless, it is important to observe that in many, many instances individual application programs have been successfully transferred from one system to another. In fact, it is a commonplace occurrence in the computer industry. Furthermore, many users have already switched from third-generation to the "3½" generation (IBM 370) and done it in a matter of hours. It seems to me that Dr. Mason has confounded the transferability issue by not distinguishing between programs and systems.

At the top of page 189, Column 2, he indicates that sharing computer time with others is not the way to get cheap computerization.

'. . .The Sixth Truth — Thou shalt have cheap computerization by sharing computers with others.

The Facts — This again was one of the bright promises laid out by the computer industry, but the deeper we get into library computerization, the more evident it becomes that sharing computers to reduce costs is a chimera. Yet, within the month, an eminent professor of industrial management who read my CLR report trotted out the old turkey that, with remote access consoles, sharing computers would soon make them economical.'

Our experiences in developing network systems do not agree with Dr. Mason's findings. In the San Francisco Bay Area, for example, we are doing a feasibility study for a network system. Our studies, thus far, have revealed that if it costs X number of dollars to service the workload at Stanford, we can service twice that load for an additional 35%. Here we have real work amplification — a 35% added charge for a double workload. That seems to me a pretty significant time-sharing and networking advantage, and it works even better when we get into triples, quadruples, and so on. Furthermore, the costs of computer memory and terminals have been progressively and drastically declining. Certainly the experience of a shared enterprise like the Ohio College Library Center contradicts Dr. Mason's claims.

Many of Dr. Mason's points are undocumented. He emphasizes that the costs of computer operations are higher than manual alternatives. He says that computerization will become increasingly expensive in the future. He has summarized that there is no decreasing costs in computers. (Is there a decrease in manual costs?) But, he has failed to provide us with documentation. At one point he tells us that machine costs run about 20 of the total costs in a computer installation, but he doesn't cite the source of this information. Studies at Stanford show these costs to be much higher — 30% to 40%.

He tells us that he has a list of by-products that either are of no use whatsoever or that have a low incidence of use, but he refrains from telling us what those products are. There are many useful by-products. For example, in serials control systems, knowing when expirations are coming up, producing and maintaining union lists of holdings, producing want lists of pieces not held but needed, scheduling binding, and so forth. There are many obvious by-products that the computer gives us that could only be attained manually with great difficulty and frustration, questionable accuracy, and high cost.

On page 191, he says:

> *'. . . Of the forty-odd computer projects reviewed on my leave in ten major libraries, not one was begun on the basis of a managerial decision, after carefully reviewing and costing the operation to be converted, costing other machine or machine-manual alternatives, or carefully projecting the costs of the computer operation after development costs.'*

Dr. Mason apparently was not paying close attention when he visited Stanford. One of the projects he looked at was the Meyer Library undergraduate book catalog. This was produced after a long and careful study of the alternatives. It was based on extremely careful advanced management planning. A detailed mathematical model developed by Robert Hayes and Ralph Shoffner was published by Stanford as a technical report and summarized in **LRTS**. As a consequence, the project is one of the most successful of its kind. It is regarded by faculty, staff, and students as an indispensable tool. I point out that it is not cheap and that we are not saving money, but we knew that when we started. However, I can add that the latest version of the catalog has been produced by photocomposition which has cut the number of volumes in half while making an easier to read catalog. By having the data in machine-readable form, we can at any time experiment with an easily updatable computer produced microform catalog, which could be considerably cheaper than the cost of maintaining any manual card catalog. None of this would be possible to contemplate with a manual system.

I conclude that the Mason paper is another in a series of articles that represent the national and international disillusionment with science and technology. The dialogue is exaggerated and although the hyperbole is stimulating, it does not offer a constructive approach that leads to problem solving. Dr. Mason's literary style tells the reader that he is not really serious. This fact alone defeats the value of his critique. He does not deal constructively with the serious problems we face: inflation, the need for standardization, and the lack of management — matters that are important to any library system whether it uses manual or automated procedures. And he completely fails to distinguish experimentation and development from actual production. This is important; lots of mistakes are made in any new technology. Mistakes in innovative procedures have a high degree of visibility. What about the mistakes in our old procedures? Are we so accustomed to them that we deny their existence?

I sum up by using an old proverb: 'Behold the turtle. He makes progress only by sticking his neck out.'