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# The United States Naval Postgraduate School SABIRS Program Utilizing the CDC 1604 and the IBM 1401

Luckett, George R.

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A: Strictly numerical.

Q: Did I understand you to say there were eight analysts ?

A: No. Eight people in the Exchange. That includes the three analysts, the combined one of who is the Manager, the librarian, two secretaries, one file clerk, one slot which is the key punch operator. But that represents the combined time of the Computer Division which they allot to us. We have this one slot which is called the key punch.

Q: Are the analysts officers ?

A: No. They are civilians. They were officers.

Q: I would like to know how many reports Mrs. Startzman could handle per week, month, year.

A: We are handling about 3,000.

Q: Three thousand a year ?

A: There is no way in the world we can say how many Logistics documents are in existence. We are till trying to collect them, and no one can tell us, nor can we find out, how many are in existence or how many there will be. It is just a figure of 2,500 or 3,000. It comes right out of the air just like that - no basis in fact.

THE UNITED STATES NAVAL POSTGRADUATE SCHOOL SABIRS PROGRAM

UTILIZING THE CDC 1604 AND THE IBM 1401

by

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In describing the Information Storage and Retrieval System of our Library at the United States Naval Postgraduate School which our programmer has named SABIRS (Semi-Automatic Bibliographic Information Retrieval System) I must first define basically the limits of my discussion which, perforce, must be within the limits of my knowledge. Since I am a librarian and not a programmer nor a computer specialist, my comments will be limited to historical and descriptive accounts of the system from the point of view of a librarian. Since I am primarily interested

in what the system will do for our library users and not, basically at least, in how it does it, programmers, computer operators and mathematicians will gain nothing from this presentation. I trust, however, that if those present are not interested in what we are doing, they will be interested in the various administrative and decision problems that we have faced and, we hope, solved. We believe that the lessons we have learned and, because our involvement was without much benefit from others' experience, the scars that we bear, might prove of some value to those who are now beginning their wending way into and, perhaps, through this jungle.

Historically, our problem dates back to 1947, the date our Library (but not our School, which is much older) was established. We began, at that time, with a small but orthodox collection of books and journals. Through a contract operation (and everyone knows that to solve a problem one lets a contract) our Library was established. The contractor, bless her heart, was a wonderful little "public library type" who had never heard of a technical report. Consequently, our library was organized to match the college and university type of the early thirties: it had books and periodicals but no money and no people. Only after it was set up, did the School employ a librarian. He also was a "public library type" but he was also, in contrast, a smart one. He convinced the administration that classified materials had no place in libraries and he succeeded in having such materials placed in the hands of a mustang lieutenant. This officer proceeded to amass a sizable collection, which except for a log-record and shelving by date of receipt, was completely unorganized and almost unapproachable. All that one had to know to obtain a classified report was the date on which the School had received it.

Meanwhile, the Librarian, hoped against hope that these nasty little things called research documents would go away if he didn't admit their presence officially. Consequently, he, like the previously mentioned officer, was gradually amassing an unclassified collection matching and exceeding in size the classified one. I say unclassified meaning, "in the security sense" because, as any one could see these were either scientific or technical and, therefore, belonged in the 500's or 600's (yes, Audrey, we were unhappily saddled with the Dewey Decimal System). They were, therefore, stuffed into Princeton files and pamphlet boxes and placed (in with the books) at the beginning of the 500's and the 600's. It was almost the simplest of all system -- one didn't bother about the author, corporate or individual, about the specific subjects, about the contract or, actually, about anything else. After about three years, however, (in 1950) our hero had learned something. He had discovered that these things wouldn't go away, that patrons had a nasty way of requesting them -- even classified ones, too! - that the fifteen stack sections filled with boxes which were, in turn, filled with reports would have to be absorbed and made available. At this point he decided on a logical action. He resigned.

In that year, I was offered the appointment as Librarian and since it was a raise, I accepted. After several months of survey work I presented the

School administration with a report that called for a three-fold increase in the staff of the Library so that we could bring order out of chaos. I was granted two additional billets. (Since this was only a one-third increase, I began to wonder if a fly-speck had made a decimal out of the ordinal number in my report). Suffice to say, that along with the two billets came a directive transferring the classified collection to the Library "because no one can find anything and the Library staff is trained to be able to do so."

That was in 1953. Four years later, we had, with a minor increase in staff, organized the entire collection so that we could find something when we knew what we were looking for. At this point we began subject analysis and because, as we were told, "Coordinate Indexing is ideally suited to mechanization," we established that system in our reports collection.

It did not take long before we realized that mechanization was a must -- that it could not be a "hope for the future" but must come now.

With some begging and some arguing, we finally were able to have one of our graduate students assigned the project for his thesis research. His program was written, his theory developed, and his SABIRS became fact. But, he was not concerned with librarianship. He was directed to provide a means of storing coded data, retrievable on demand. He was given a series of criteria by the librarians also assigned to the project. These were:

1. Size of the file to be covered
2. Rate of growth of the file and system
3. Range of inquiries to be serviced, or the purposes to be served.
4. Range of subject matter to be covered.
5. Kinds of concepts to be represented.
6. Specificity and type of analysis.
7. A specified limit on the personnel required to do the analysis.
3. The availability of funds that could be allocated to processing information and conducting searches.
9. A statement of desired reliability of results, or probability of retrieval.
10. A general idea of what we hoped to accomplish.

Additionally he was told that storage and retrieval must consider several categories of information, which were:

- (a) The Corporate Author(s)

- (b) The various descriptors that portrayed the subject content
- (c) Date control consisting of "not later than," "between this date and that" and "not earlier than"

Statistically determined on the basis of reader demand, the above three approaches were deemed sufficient. Our experience showed that the number of inquiries received in which the personal authors or the titles were the known facts was so small as to be insignificant.

Similarly, the "descriptors" listed in our glossary were determined on the basis of consideration of supply and demand. Starting with existing uniterm glossaries, we edited out those terms not currently and never likely to relate to curricula at our School. In addition, we added to this list, those descriptors which we knew, by experience, were used as approaches to report materials in our collections. Terms such as particular models of equipment, airplanes, etc., will be found in our glossary whereas, those relating to botany, medicine, etc., were eliminated. We did not concern ourselves with "aspects" or with "false drops caused by the interchangeability of nouns and modifiers" and the resulting errors in retrieval. As you know, this has been exemplified many times by the statement: "without aspect control, you may request material on 'Venetian blinds' and get, along with the desired material, reports and data on 'blind Venetians'." To date, I might facetiously add, we have never had a single request for either "Venetian blinds" or "blind Venetians." We have, in fact, viewed "false drops" not as the detriments they might be in a research laboratory but, since we are an educational institution, as opportunities for serendipity. Our plan was, as can be seen, to serve our public with our holdings. We looked to ASTIA (now DDC) for reports we didn't own and even for the designation of owned reports by subject approaches we hadn't used if ever we should add a curricular subject. With such assistance readily available we believed that we could effectively meet any reasonable demand that could be made. You see, in an educational institution, unlike a research laboratory, curricula and courses are not added overnight. They are developed over a period of time and, if the Librarian participates in such discussions, he will have, as he must have, time to develop his library collections to meet the anticipated faculty and student demands.

So much for the history leading to the establishment of SABIRS. We now come to a review of what it does and how well it does it.

First, of all, while we hoped for success we did not let go of the life line. Concurrently we have maintained, the posting of our coordinate index cards. This is currently being handled by an auxiliary computer program.

Second, we began SABIRS as of November, 1961 and we did not add any material retroactively.

Third, we have, as of this date incorporated approximately 11,000 reports into SABIRS.

Fourth, we decided to be satisfied for a while with coded, or accession number print-out. By this, we mean that, in response to an inquiry the requestor received a list of document numbers with which he may then review, using a shelf-list in accession number sequence, cards bearing descriptive and abstracted data. Since he is, at the same time, informed of the security classification he can browse in the unclassified report section or specifically request those that are classified.

Fifth, Reader approach is specific but does allow for gray area retrieval. For example, since disjunction of descriptors is not a part of the system, the requestor submits several requests, broadening them as he goes, by dropping descriptors or by interchanging them; for example -

If the inquirer wants reports on equatorial or polar satellite navigation using Doppler methods he uses these uniterms to ask the search question:

- (1) Satellite, navigation, polar, Doppler
- (2) Satellite, navigation, equatorial, Doppler
- (3) Satellite, navigation, Doppler

Also, since he might expect to find something specific in more general reports, he asks also for

- (4) Satellite navigation
- (5) Doppler navigation

While the above, undoubtedly, in a research laboratory would provide an unusable mass of reports, such is not the case in an institution where education and broadening of knowledge is much more important than specifics. The inquirer, if he so desires, may further limit his search by specifying a particular source or sources, and as indicated earlier, he may restrict the output to include date of publication limits: earlier than, later than or between this date and that. The first limit permits a smaller output when the inquirer knows that the desired data was authored by certain selected corporate bodies; the second reduces the output when the inquirer's request may be date oriented (e. g. he knows that the desired data appeared within the past year or during the Summer of 1962 or was released earlier than last November because that was when he saw a copy). In each of the above instances, he can also enter a second inquiry at the same time without those limits. (This would be in answer to a question such as: "I think it was a G. E. report" or "I think it came out last Summer".) The print out, which appears as two answers, gives him a brief bibliographic report to scan first and if the requested data does not appear thereon, he can broaden his examination of documents to those beyond his "guess".

The specification of the inquiry is only slightly limited in the number of possible sources, and the number of descriptors. The latter is limited to twelve descriptors, the total of descriptors, sources and date may not exceed fifteen.

The input of data to the system and its retrieval from the system is unified: that is, up to 64 inquiries may be made and on the same run, up to 5,000 new records may be added and 1,000 may be deleted. In this way, we keep our file of records up-to-date at all times by adding, deleting and searching on a daily basis. Should urgency require, special additional inquiry runs are made during which there are neither additions nor deletions.

Our experience has taught us many things. One is, that our users are highly pleased with the service; even though we have only slightly over 11,000 records in the system, we run on the average of between four and five searches daily. The second is that, being an educational institution we can anticipate. By this, I mean, that since we are informed in many instances of the subject matter to be covered in courses, we can pre-run inquiries actually before they are received. We formulate the various expected inquiries and use the space available within the 64 question spaces. We then store the print-out for several weeks and, lo, when the inquirer arrives: "instant bibliographic service." Similarly, we use these empty inquiry spaces to post our descriptor records which, in reality, are nothing more than anticipated reference inquiries. The third is that, since our students and faculty are predominantly engineers or scientists they have more confidence in the computer output than they do in a bibliographic literature search by a librarian, who is not a specialist in their particular field. Somehow, the fact escapes them that the computer puts out only what is put in and what is put in may have been the result of the work of the same nonspecialist librarian/analyst. I believe that they are not really afraid that we might miss something, but that we might purposely pass over something as irrelevant when they would consider it pertinent.

Fourth, we have learned the importance of administrative understanding and concurrence in our projects. We must not, ever, be put in the position where the Library use of the computer might be considered secondary to other uses and be, thereby, eased out in the computer-time assignment. This story, which is true, illustrates my point.

A long time ago, when I was but five years old, I arrived home for lunch well after the appointed hour only to learn that my father had gone to search for me and was, at that moment, cutting a switch from the hickory tree in the back yard. My grandmother, an understanding woman, to say the least, opened the bookcase and handed me a thin but substantial book. (I remember, to this day, that it was a child's version of Don Quixote).

"Put this in the seat of your pants," she instructed me.

The result was that I received my punishment and, following her further instructions, cried ceremoniously.

The lesson, however, was not learned and the next day, with no fear in my heart, I came in late again. Seeing my father again cutting a switch, I knew what to do. I ran to the bookcase, but, alas! It was locked. Needless to say, I learned my lesson -- "Come home when you are told to come home." I was further instructed, visually, when, following the whipping, my father reached into his pocket and extracted from it, the key to the bookcase. This lesson which falls in the category of "keep your powder dry" has a further implication when applied to librarianship and information retrieval. I revere it almost as if it were holy law.

"Whenever mechanical equipment is placed between the book and its user, possession of the key is of paramount importance."

Fifth, we have learned the importance of determining the value of the services the computer makes possible before we make them generally known. The provision of borderline services or data conceivably might prevent the accomplishment of more valuable ones. If Professor Parkinson were to consider this problem, he might add another Parkinson's Law stating:

"When useless services, statistics, or data are provided, knuckleheads will appear in similar quantity to demand their continuation."

Sixth, we, having chosen automation, even in this limited sense are not completely sure that our choice was the correct one. It is something like participating in a Floristan toothpaste test. The choice may result, even though one doesn't know it at the time, in bringing a toothy smile to your face several years later or it may result only in more holes in your head. It might even be expressed, if I may make a pun, as "Cavity emptor"

Finally, no paper can be ended without a look into the clouded crystal ball of the future. Here is what we see -

(a) A program has been written and tested which will provide readable, rather than coded print-out. Instead of accession number output, we will obtain a descriptive bibliography with a not to exceed 600 character abstract for each item. This will be placed into operation within the next three months. This was anticipated at the start but we did not want to delay operation while waiting for this improvement. Because of the anticipation, however, we have retained all paper tapes used in Flexowriter catalog card preparation. These will be used to assemble the bibliographic mag-tape file without further work. This program will also read in future tapes, look up the descriptor in our mag-tape glossary and enter the descriptor coded data as well as the abstract in our storage file. Searching the storage file will still result in accession numbers but the process will continue to match these numbers with the bibliographic data - the print-out being English language copy identical with that in our card catalog.

(b) We are compiling profile data for our faculty, but we are not requesting their cooperation. Faculties, being what they are, have much broader interests than have research specialists. With cooperation.

our profiles would be similar, at least, to the two-faced Janus, but probably most would appear to be Hydra-headed. Our profile data, therefore, is being compiled from questions actually asked. In this way we know that our data will describe the needs of the person rather than his broad interpretation of his interests.

(c) The more distant future shows ultimately a cable-connected console in the Library inter-locked with the main computer on a delay-time basis. With the console will be a display tube and a small Xerox-type printer. The inquirer's questions, in descriptor terminology will be placed in the system immediately upon receipt. Card pictures will appear on the display tube and can be scanned by the inquirer who reviews them at his own selected reading speed. When he encounters a pertinent bibliographic and abstracted reference of particular interest to him, a simple push of a button will result in a Xerox paper copy that he can retain.

Here, then, is our system. Past, present, and future. We like what we have done and we look with interest toward the future. But, please, do not think of us as mechanically minded or even machine devotees. As my male staff members often say, "We could do all that we are doing now, and a great deal more if the Navy had provided a supply of good-looking gal librarians instead of a computer." However, "they continue "having both would improve the situation immeasurably." As one says, "the computer would generate the additional spare time that I would then need."

#### DISCUSSION

Q: George, has the program increased cost of library operation - you know - equipment, personnel wise, and so on?

A: Actually, we have added no one to the library staff to do this because we are doing all of this beforehand. All the analysis was being done at the same time. The actual entry of the material into the system is one on the paper tape from the Flexowriter which we did before the preparation of the catalog cards, so that all we have had to do was to establish the program and use already existing documentary material to put it into the system.

Q: How about the equipment? Do you rent or own the equipment?

A: The School - that is, the Computer Center - owns part and they rent part. Of course, I am not taking that into consideration. They have dropped that anyway. According to statistics over the past, I think it is about six months, we have used one tenth of one per cent of computer time, so it is a very small drain on the system.

Q: Do you plan to go back and pick up your back collection?

A: Yes, but only after weeding. At this particular point when you are suddenly faced with a tremendous mass of material that you have never

even looked at, it would be silly to start a group of people analyzing and putting it into the system. Most of it is probably dead. Incidentally, to answer your question, they are all pre-numbered, so all we have to do is add a one in front of it to bring it up into a system as advanced as ours - anything we want to key.

Q: Are your codes alphabetical or numerical?

A: The codes are numerical - octal.

Q: I am interested in that sixty-four questions at once that you run. I was told I could only run nine or ten. They are not on the ball down there, are they?

A: I don't know. Ours answers sixty-four at a time. In fact, the print-out is rather interesting in that, first of all, it will give the name of the person who asks the question and the number of his particular question. If he asks ten, there will be, for instance, Lockett 1, Lockett 2, Lockett 3, and there will be a list of material answering each of these questions.

Q: I don't know that this will get you any more people necessarily, but it would seem to me that you are educating your users to be acquainted with a service that they may find in some of their subsequent assignments ashore, and perhaps be more sympathetic to the requests by libraries for separate services.

A: I think you are right in this. Our big battle in the past has been confronting those Flag Officers who take a look at the library and (should I say this?) say, "Look where I got without a library."

Q: There is one very good answer to that. You say, "Yes, Sir, you did, but unfortunately we don't have other Flag Officers like you in the Fleet."

A: I am thankful for that.

AN AUTOMATED CIRCULATION PROGRAM AT A  
GOVERNMENT R&D INSTALLATION

by

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Picatinny Arsenal's Technical Information Section shares in the Big Problem of technical libraries everywhere - too much business, too little help. Its collection of 29,000 books, over 900 current periodical

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7th MILITARY LIBRARIANS' WORKSHOP

"Procurement and Retrieval - Meeting the Challenge"

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UNITED STATES NAVAL ORDNANCE LABORATORY, WHITE OAK, MARYLAND

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PROCEEDINGS OF THE  
SEVENTH MILITARY LIBRARIANS' WORKSHOP  
"Procurement and Retrieval - Meeting the Challenge"

ABSTRACT: Papers presented at the Workshop on library operation make up the Proceedings. A panel on the Army STINFO program and one on procurement were important contributions to the Workshop. Two sessions were devoted to library operation - one using computer, the other using automated equipment. Questions and answers at the end of the talks are included.

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