THE USE OF COMPUTERS IN NIGERIAN LIBRARIES: EXPERIENCES AND PROSPECTS FOR THE FUTURE

Paper presented at the NLA Conference held on March 16th-18th at Abeokuta, Ogun State, Nigeria.

By
ELAINE F. NWAJEI
Senior Librarian
IITA, Ibadan

During the 1950s and 1960s, the term "information explosion" was coined to refer to the vast increase in information being generated. However, today we are facing an "information revolution", that is an enormous change in th an "information revolution", that is an enormous change in the systems of handling these increasing volumes of information.

Over the last decade, developments in microelectronics have reduced the size of circuits and increased their reliabilty and speed of operation by several orders of magnitude. In the 1960s libraries made use of computer equipment owned by their parent organization or formed networks in order to maximize the use of computers. During the 1970s, minicomputers began to appear in individual libraries, and now, during the 1980s, they are being applied to library systems. Microcomputers can perform most of the information-handling functions traditionally run on larger computers, such as circulation control, acquisitions, cataloguing and retrieval.

Furthermore, during the last decade, computer processing of information has become routine in the technologically-developed world. Computers are applied for the generation, storage, and retrieval of information - from manuscript preparation (using word precessors) through composing, printing, abstracting/indexing and literature searching. The number and variety of databases available online are increasing daily. Many of these databases have become searchable online through a new kind of organization called a "search service".

These organizations provide the computer and supporting services that enable online searching to be undertaken. The search service assembles databases from many suppliers and makes them available to many users via a computer which can be simultaneously shared. The search service also serves as agents for arranging the communications (commonly the telephone) between users and the search computer. In the Western world, distance is now no hindrance, for recent advances in the field of digital communications have enhanced the use of telecommunications as a medium for remote searching.

In England and USA there have also been experiments in bringing information into the home in the form of data systems known as Teletext and Videotext or Viewdata. In these systems the television set in the home is linked to a large computer data base via the telephone network. These systems remain largely experimental and have not had univeral success as yet.

Yet another recent advance is optical disc technology, and this innovation shows all the signs that it is going to be a big success. In fact it is likely to replace microforms almost entirely. Optical discs have the not insignificant advantage of random-access capabilities, and may also have a cost advantage, since they can be adapted to existing mini-or microcomputer installations. In late 1985, the various organizations providing CD-ROMs (Compact Discs - Read Only Media) reached agreement and produced a standard for disc technology.

Widespread use of the standard will enable software publishers and providers of data services to distribute their products on uniform compact discs. These optical storage discs, in turn, will be readable by CD-ROM players connected to any number of different computers - from micros to mainframes. CD-ROM is a phenomenal storage medium which can store up to 800 million characters of data or 150,000 printed pages on each disc.

Many libraries and institutions have started pilot projects in this field e.g. the National Agricultural Library of the United States which is experiementing with putting part of its collection on CD-ROMs. The capability to store both digital and analog data makes the use of the videodisc extremely flexible, since both text (in digital format) and graphics (in analog format) can be stored on the same medium. CD-ROMs also present a high quality display (at least as good as that of the printed publication).

When storing a full-text data base, random access is particularly critical as a means of ensuring a good response time. Even though the full-text data base selected at NAL for the project utilizes only a small portion of the disc storage capacity, speed of access is an important consideration.

While these advances have been taking place apace overseas, little progress has been made in Nigeria. The result is an ever widening gap which makes it difficult for Nigeria and other countries in the same position to catch up and adopt the new technologies.

Whilst there are approximately 171 libraries operating within Nigeria, the number of libraries which have made any attempt at all at computerization can almost be counted on finger tip. Let us enumerate the experiences so far of Nigerian Libraries in the area of computerization:

1. The University of Nigeria, Nsukka, computerized its serial holdings within the library system as far back as 1977.
2. The University of Ibadan Library has also computerized its list of serials holdings. This was done even earlier than Nsukka, in 1973, and the UI Library is now studying various library software in order to extend its areas of computerization.
3. At Ahmadu Bello University again a computerized list of serials has been produced. Its list of holdings covers the eight libraries within the library system. Also a pilot project was set up in 1976 to computerize the circulation records using books in Class T. (Technology) section. Entry was direct through interactive visual display units located in the circulation section.
4. At the University of Lagos, a Plessey minicomputer system was installed in 1982, and computerization started with the storage of records starting with those already in circulation.

5. At the National Library of Nigeria a minicomputer has been purchased which has enabled the NLN to embark upon the computerization of some of its operations e.g. the compilation of the National Bibliography of Nigeria.
6. At the International Institute of Tropical Agriculture an integrated system was introduced in 1984 utilizing the institute's minicomputer. A library software package known as the Basis Technical Library was purchased from Battelle Incorporated, which has its offices in Ohio USA, Geneva and London. This package provided for a unified database combining catalogue, acquisitions, circulation records and journal titles and articles.

Immediately the software package had been installed a conversion from manual to computerized operations was begun in almost all areas of the library simultaneously. Additional data entry personnel were employed and they together with the library's regular typing staff, made the data input from five terminals installed in the library's offices which were connected to the institute's minicomputer in another building by cable. We also made use of some terminals in other offices as and when they were available.

Since the Basis software is straightforward and "user friendly", little training was necessary. Those of us who had attended the lectures the Battelle representatives had given during the week they installed the system, were able to instruct the data entry personnel in the operation of the system, and, in addition, in order to have standarized entries, memoranda were circulated from time to time with information about method of entry. The terminals were added as soon as possible to the institute's UPS system (UPS - Uninterrupted Power Supply) in order to avoid interruption by power cuts. In a computerized system even a small interruption could, not only slow down the progress of the work, but quite possibly lead to loss of records.

Barely six months after intensive bibliographic data input began, the retrospective conversion of the card catalogue was completed. This exercise reduced the over 170,000 card catalogue entries into some 24,000 automated catalogue records. However, each record has approximately 50 "fields" (author field, publisher field, availability field, subject field etc.) Almost all these fields are searchable, which means that with a computerized system there are many more ways of searching for information e.g. if someone comes to the library and asks for a book published by FAO in 1982, but cannot remember the author and title, we can search for it in the computer using publisher and year fields.

Furthermore when conducting a title search, it is not necessary to know the first words of the title. If the user can remember any one or two words of a title, the book can be found from those. Similarly, in an author search it is not necessary to know the first author. A book can be found from the names of the second or third author. So it can be seen that, in the computer, although the number of records is smaller, the methods of approach - the search strategies - are greatly increased.

The retrospective conversion of the nearly 1,000 books on order slips started about a month later than the card catalogue, and from that time all fresh book orders were entered into the computer direct.

Serials were computerized to a certain extent by the entry into the computer of their titles in the same manner as book titles. However, serials control by computer has now advanced a step further by the installation of the new STACS package of BASIS (Serials Tracking & Control). The implementation of this is only just beginning, but it is expected that it will replace the Kardex record of periodicals, and we hope it will contribute to ease of serials control especially claims for issues which do not arrive as expected.

As these retrospective conversions were bring completed (catalogue & acquisition records - serial titles) the conversion of all outstanding loans records was started, too. This was soon accomplished. Thenceforth, every new loan transaction was made by means of the computer.

From early 1985 all periodicals arriving in the library were scanned for articles relevant to IITA's research, and records for such articles entered in the computer. From its inception IITA has always published an accessions list containing not only new book and journal titles but also recently received articles likely to be of interest. The retrospective entry into the computer of periodical articles from such lists has yet to be done. The main problem is the allocation of subject index terms to each article. Our hard-pressed cataloguing staff have not as yet found time for such a major project.

A Philips model GP 300L Printer has been installed in the library and it is used for the print-out of book orders, overdue notices and bibliographic lists.

In May of 1985 a decision was taken to remove the card catalogue since by this time all old and new records were in the computer, and the card catalogue was out-of-date since new titles were not being entered there. This led to much pressure on the circulation and reference staff for some time since all users had to aproach the circulation desk for computer searches instead of searching the catalogue themselves. After six months the pressure eased up since a user's read-only computer system was introduced.

We held training sessions so that users would be able to make their own searches in future (from their offices if they like - no need to even leave their desks to search the library as long as they have a computer terminal in their office!) The system provided for a means of making searches without the ability to update the records (i.e. no possibility of someone deleting his name as the borrower of a book!) A guide to the database is now being prepared since we found that users were often requesting to have something in writing as a guide while conducting searches on the user access system.

From my own viewpoint the two most useful aspects of the computerizastion is (1) the fact that it is an integrated system, and (2) the case with which literature searches, together with a paper print-out can be made. I would like to explain that the system is "integrated" in the sense that the same record is used in the acquisitions, cataloguing and circulation processes. When a book arrives the record is converted to a catalogue record and the necessary additional information added, and when a book is borrowed, the availability field is changed from "shelf" to "out", and 3 other fields filled in, namely name of borrower, date borrowed and date due for return.

Compiling bibliographic lists can be very time-consuming in a manual system, but with a computerized system it becomes very easy. During the past month, I have made 23 such lists on such subjects as "Rice in West Africa", "The Effect on Soil Fertility of Land Clearing by Burning" and "Grasshoppers with special reference to Zonocerus species". I have made these lists as requested by library users, and it is a simple few minutes job to produce such a list covering books and recent periodical articles.

The user access system also has provision for making print-outs, so it is quite possible for a scientist to stay in his office,

conduct a literature search via his own computer terminal and then, by making use of the print option on the user system, have his list printed out in the computer room. How many scientists are actually doing this is impossible to say, for it is all done without contact with the library.

We also hope to have soon CD-ROM capability since IITA is one of the organizations chosen by the Commonwealth Agricultural Bureaux in their pilot project. This project is similar to the one being conducted by NAL, i.e. to put a sample number of full-texts on CD-ROMS as a trial before adopting optical discs fully. This means that IITA will soon have the CD-ROM player which will probably be attached to the Mackintosh Microcomputer which the library has recently acquired. Soon after acquiring the player we hope that CAB will start to send us the first CD-ROMS.

I have tried thus to give a brief outline of the achievements of Nigerian libraries in the area of computerization. Now I wish to examine the problems encountered in the process of computerization.

According to G.A. Alabi[1], UI has been faced with three major problems - shortage of skilled manpower, computer breakdown and low level of electricity supply:

> "They have been confronted with a number of problems, notably that of updating. This problem is not of the library's own making but it is the usual problem which confronts most computer installations in Nigeria - shortage of manpower. Coupled with this, of course is the problem of computer breakdown and low level of electricity supply."

At Ahmadu Bello University there are indications that they are faced with the same three problems so also is the University of Lagos, with the addition of financial problems. The installed equipment at Lagos functioned for about three weeks before it broke down. Efforts at replacing the damaged parts were hampered by lack of funds to follow-up the installation and lack of foreign exchange to procure replacemtns for the damaged components.

At IITA we are fortunate that our institute has funds abroad, and so we do not face foreign exchange problems. We also have had little manpower problems. Although the library has no qualified computer personnel, we are able to make us of the human resources of the Computer Unit as and when necessary. The Computer Unit has a computer manager, four programmers and two engineers. However, there was little knowledge of computerization amongst the library staff prior to 1984, and we went into the project totally unprepared and with some misconceptions. It also took us some months to understand the full capacities and intricacies of the system.

I will give a few examples: The representatives of Battelle who installed the system only gave us a few lectures before they handed over the system to us. It was only those of us who spent time to read the manuals thoroughly and experimented on the computer who learnt the full potentials. Furthermore the installation was made within one week and I found out later that not all the programmes were suitable for our purposes. It took me some time to discover how they could be changed and adapted to our needs e.g. the programme for printing out book orders printed out each title on a separate form whereas what we needed was a programme to print the orders as a list. So new programmes had to be written to replace those not suitable. Where the changes to the programmes were small, we were able to do this ourselves, but in cases where a whole new programme had to be written, we had to call on the institute's computer programmers to help us.

One misconception I had at the beginning was that computerization will lead to a reduction in staff, particularly in the cataloguing section, but the expected reduction was a mirage. One of our cataloguers, near the beginning, fondly imagining that he no longer needed typing assistance, carried some books to the terminal to catalogue them direct. It was not easy. He would turn the pages of the book, type, turn the pages again, type again etc. Finally the cataloguing section devised a data entry form as the most efficient method. The form covers all relevant fields of the catalogue record, and the cataloguers fill in the details for each field and hand the form over to a staff whom we would have formerly called a typist but now, with computerization, a data entry clerk, who types the information into the computer.

Furthermore, some of the work-load of the acquisition staff has now been shifted to the cataloguing section. Previously the acquisition staff would match newly arrived books with their order slips before sending them for cataloguing, but now the matching is done by the cataloguing staff, by finding the entry in the computer.

Another reason why the cataloguers are hard-pressed is because there is now greater need for analytical entries. Let me give an example. A book on land clearing methods which has a chapter on mechanized clearing in Japan and another on bush burning in Brazil, if it is given index entries in the computer under the obvious choices of (i) Mechanization (ii) Japan (iii) Bush Burning (iv) Brazil, and (v) Land Clearing, is likely to be erroneously retrieved, since it can be retrieved by someone searching for mechanized clearing in Brazil, when, in fact, it contains nothing on the subject.

If subject entries are chosen which avoid this wrong retrieval e.g. Land Clearing, Mechanized - Japan, it will become more difficult for someone genuinely looking for mechanized land clearing in Japan to find, since he is unlikely to search under such a subject heading. He will likely ask the computer to find subject (A) Land Clearing combined with (B) Japan, and (C) Mechanization. The only solution is for the cataloguers to make analytical entries for each chapter with each analytical entry having its own set of subject descriptors - obviously a difficult task when some books can have up to 80 chapters.

What we did not realize at first was that because of the difference in search strategies, the whole process of cataloguing takes on a different aspect. Computerized searching involves combining variou terms rather than looking for a single subject heading as with the subject card catalaogue. The solution would appear to be to increase the number of records by making more analytical entries. We are not making many more analytical entries than previously.

In addition, we are now giving more thought to certain issues which we summarily dismissed in the beginning e.g. the possibility of having major and minor subject fields and also having a thesaurus entered into the computer in order to standardize and regulate subject entries. In fact we have now purchased the computerized version of the CAB thesaurus, and we are now in the process of standardizing our already entered index entries in accordance with this.

It is also necessary to be informed of the security problems of a computerized system. Someone who understands the system well (and is annoyed with the library for some reason) can simply command the computer to delete the database and

then all the library records are gone just like that. Because of this problem we have a back-up system by which the database is copied from time to time. In that way it would only be possible for a disgruntled person to delete a few of the more recent records - not all of them. With the advent of CD-ROMs the security risks are even greater since they make it possible for someone to walk off with 150,000 pages in the form of a small disc hidden under his shirt.

At first I also did not understand the importance of the password. Those using the user access system do not need a password, but for data entry staff there is a secret password to be typed while logging into the computer. However, last year some of us had suspicions that the password had been found out and that an unauthorized person had been making alterations to some of the records in the computer. It is of utmost importance to keep the password secret in order to avoid the situation where library users are able to delete their names as borrowers of books or delete the records of the existence of some of the books altogether.

Another mistake we made was the removal of the card catalogue too soon. It led to a flood of protests including one letter signed by all the scientists of an entire department. Ideally the user access sytem should have been installed from the very beginning with complete documentation so that users could have started searching the system for themselves a lot earlier and would have been used to it by the time the card catalogue was removed. Now that the computer access to the library is available to all users the protests have stopped and I believe the library's computerized system will be totally acceptable once the written guid is available for use.

So much for the particular problems we have encountered at IITA, which were partially, at least, caused by our lack of knowledge and preparedness. In addition, there are two generalized problems facing Nigeria which should be mentioned. One is the inadequacy of the telecommunications infrastructure which makes remote searching of databases overseas near impossible. The second one is the fact that Nigeria as a country, distant from the major centres of development and expertise, will tend to represent a rather limited market for computerized library and information systems.

Only a very limited range of hardware and particularly library software is marketed and obtainable here. In fact the only firm I know that markets library software is called Modelor Design Aids Limited. Their representative informed me that they are marketing library software which is being considered by the University of Ibadan. If hardware and software are ordered from abroad, libraries face all the problems of foreign exchange transactions, maintenance, servicing and replacement of faulty parts.

Most of the problems facing us, as outlined above, can be solved by education and research. There is a need for library workers to be conversant with computer technology as a means of easing communication with computer personnel and helping to break down barriers by creating understanding. It is necessary for Nigerian information professionals to familiarize themselves with computerized information and documentation systems. This can be done by keeping up with the literature on computerized systems, and also by visiting computerized libraries. I know from my own experience that the theory is difficult to understand without practical exposure. When we introduced our system at IITA, all that I had been reading suddenly came to life once I was able to see the practical application.

The example of the Nigerian Institute of International Affairs is a good one to follow. They have a computer installation which they are using at the moment for primarily word processing purposes. Thus their staff are beginning to get used to computers and terminals before they actually embark on full scale computerization. Their librarians have also visited us as a group to study our system, and they sent a computer-oriented member of their staff to work with us for two weeks in order to study the feasibility of adopting our system.

The library schools in Nigeria are making efforts to incorporate new elements of education and training considered vital for successful library automation, but lack of specialist teachers and poor teaching facilities make this a difficult task. In addition continuing education is becoming **increasingly important in order to update skills and get informed about new developments.**

Because of Nigeria's distance from the countries which had had "computer revolution", considerable co-operation could and should develop within the country amongst those people and organizations involved in computerization. They should also share knowledge about the availability of suitable computer hardware and software, and about the amount of follow-up support likely to be forthcoming from the company marketing the products.

With the unpleasant constraints we are experiencing in this era of austerity, obviously products available locally would be ideal if such products could be found. Librarians who have some contact with computer companies in Nigeria could also **help by encouraging them to develop library software. When there is sufficient demand I believe the products will be forthcoming.**

Reviewing the literature on the subject of library computerization in Nigeria over the past decade, it seems to be a case of "much ado about nothing", since a lot has been written, but very little achieved. It is time now for all those plans to come to fruition. N.M. Adeyemi[2] has rightly observed that "the shortage of information in the developing countries constitutes a major obstacle to their economic, social, cultural and technological development." As said earlier, all the invaluable information being stored away should be made available to foster early computerization of library services.

Mr. Adeyemi further describes the hoarding of information that would have enhanced computerization as a "yawning gap" between Nigeria and the industrialized nations. It is time to close that gap before it becomes even wider by becoming better informed ourselves about the information revolution" and by taking steps to improve our own library and information systems so as to provide an enhanced service to our users, befitting to our technological age, and designed to aid our users to keep up-to-date with developments in their own academic, professional, scientific and technological fields.

REFERENCES

1. Alabi, G.A. (1986) Library Automation in Nigerian universities. Information Development 2(3) pp. 163-164.
2. Adeyemi, N.M. (1983). New technology and the developing countries: the Nigerian experience, pp. 241-250 in: The Challenge of Information Technology, K.R. Brown (Editor). North-Holland Publishing Company.

IITA LIBRARY CATALOGUE INPUT SHEET

Call Number: Publication Type:
Author( ):

Title:
J. Title:
Pagination: Copy No.: Volume:
Year: Language:
Publisher:
Place:
Corp. Source:
Series:
Descriptors:

Comment.

An example of the catalogue input sheet in use at IITA