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COMPUTER TECHNOLOGY AND INFORMATION RETRIEVAL IN NIGERIA

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Computer technology, though still advancing in developed countries, is still in its infancy in Nigeria. The benefits of this technology are highlighted and its potential as a fast and easy way of communication globally is undisputed. How can Nigeria benefit from this technology? Some of the problems of introducing this new technology and actually making it work are discussed.

Computer technology is the introduction of computer and networking into a system. The computer is not only a fast tool but has great flexibility, speed and a potential for expanded cooperation and service. It has no doubt, brought significant dramatic changes to libraries in developed countries. These changes are more evolutionary than the revolutionary changes anticipated in the early 1970s.

Computer technology is still in its infancy in Nigeria. Very few libraries have automated or started to automate their library services. Even those who are on the verge of starting are faced with various problems including funding.

So often, the tendency is to think that the system of today will remain unchanged over time, yet we know that technology and our utilization of it will certainly evolve and change. For this evolution to be effective, therefore, it is essential to monitor the system, provide feedback channel, evaluate the system's performance against changing requirements and factor improvements into the ongoing system.

An inevitable outcome of automation is the replacement of the three-by-five-inch card catalogue with the on-line catalogue, centrally maintained on shared equipment or maintained locally on a stand-alone system.

Beyond a library's local collection lies a wealth of information held by other libraries or collected by affiliated academic or government departments. While these information may be a tremendous value to readers, access to them is usually difficult. On-line catalogues have been used to improve this situation.

IMPACT OF AUTOMATION ON LIBRARIES

The impact of automation on libraries has varied significantly among libraries in developed countries. While some have increased staff, others have decreased staff and still others have realised the goal of processing more materials with the same staffing level. The difference, however, will depend on factors like prevailing conditions before automation, staffing levels before automation, attitudes and interest of library staff, the extent to which staff have been enc..iraged or prepared to deal positively with this new technology, to name just a few.

The first wave of electronic technology in libraries has seen card catalogues and bibliographic indexes moving from print to electronic form. Card catalogues have been housed on mainframes or minicomputers and bibliographic indexes typically available on CD-ROM or through on-line services and accessible only at selected stations. Two factors affecting the direction of this technology are:

(a) increased speed and storage capacity of computers and
(b) the ability for individual stations to be networked locally and globally.

These two factors are influencing hardware and software producers, the media, and the increasingly computer - literate public. To the end-user, however, these two factors

appear as one - the amount and type of information now available in electronic form has increased tremendously. In the past, only indexes were available electronically, but now even primary materials are also available. As the speed and processing power of computers multiply every 18 months, so does the storage capacity grow at a similar pace. Increase in processing power has also brought with it the capability of handling not only large text files, but also graphic files. This increase in storage capacity of microcomputers has made it possible to store and search large files, such as MEDLINE, which were previously available only on mainframe computers.

Perhaps of even greater consequence for libraries is the networking of computers. Networking has even led to greater advancement - the introduction of the Internet. Networking on the academic campus of most libraries abroad is almost synonymous with the Internet. With advances in on-line technology, communication and networking, the emphasis has shifted from systems development, design and experimentation to system specification and choice, implementation, functional integration, measurement and evaluation and greater inter library cooperation and sharing.

PUBLIC ACCESS COMPUTER SYTEMS

A public access computer system may be defined as any library computer system that a patron can use directly.

Examples of these are:-

a)   On-line Catalogues
b)   End-User searching services for remote databases (Internet, Remote login)
c)   CD-ROM reference databases
d)   Local reference databases on mini frames or cluster of microcomputers (Local Area Network or LAN)

Prior to the advent of public access computer systems, library automation had focussed primarily on improving the effec-

tiveness and efficiency of internal library routine\functions such as Acquisitions, Cataloguing, Circulation, Inter-library loan and Serials Control. The benefits of automating these functions were significant, though not always. visible to library users. Presently, however, automation of library functions are now becoming unmistakably apparent to users. Public access computer systems are based on computer and telecommunications technologies, which are evolving rapidly.

Computer - assisted information retrieval is a new approach to the old problems of locating printed information that is pertinent to one's research needs. In this new approach, the familiar index or abstract publication is replaced by a time - and - effort - saving computer system. Trained librarians provide this service to clients. In practice, a client with information needs approaches the librarian who now establishes a set of usable subject terms or keywords which adequately describe the topic to be searched. The search is now done on-line and the result down-loaded on diskettes. In addition to retrospective literature searching, a selective dissemination of information or current awareness are also available from some databases. This allows the user to automatically review new references to work in their subject area as they are added to the databases, to keep abreast with current developments in the field.

THE INTERNET (A GATEWAY)

The Internet is a worldwide network of computer networks. It is comprised of thousands of separately administered networks of many sizes and types, each comprising tens of thousands of computers. The total number of individual users of the Internet is in millions. This high level of connectivity fosters an unparalleled degree of communication, collaboration, resource sharing and information access. For the Internet to exist, there must be connections between computers and agreements on how they are to communicate. Connections can consist of any of a variety of communication media such as metal wires, microwave links, packet radio or fibre optic cables. One of the greatest benefits of the Internet is the

Electronic mail (E-mail). E - mail is a fast, easy and inexpensive way to communicate with other Internet users around the world. Internet users appreciate the expanded capability to communicate with colleagues around to obtain important new sources of information, collaboration, and professional development.

In recent times, customer awareness and use of the Internet has expanded at a phenomenal rate, offering unique opportunities and challenges for the publication and dissemination of electronic information. Librarians worldwide have exploited this development. A glance at electronic conferences on the Internet shows over 150 conferences related to librarianship and related and varied issues. It has now been shown that librarians are using the Internet to correspond with each other, share views and provide details of the wide services they require and use.

REMOTE LOGIN

Remote login is the ability of a computer user in one location to establish an on-line connection with another computer elsewhere. Once a connection is established with a remote computer, the user can use that remote system as if their computer were a hard-wired terminal of that system. This facility is called Telnet. Utilizing Telnet, an Internet user can establish connections with a multitude of bibliographic databases, data files and other on-line services. Networked information is independent of location. This means that a library in Nigeria can remotely log on to any other library within Nigeria, a library abroad and even on to commercial databases such as Dialog, OCLC and R-LIN in the United State of America.

ON-LINE CATALOGUES

*On-line Cata*logues are the electronic catalogues (computerized catalogues) of automated libraries. Each establishment usually gives its own electronic catalogs names e.g.

The University of London	LIBERTAS
The University of Birmingham	BOSS
The University of Iowa	OASIS
Iowa State University of Scienceand	
Technology Ames	SCHOLAR

Once there is cooperation amongst these libraries, the cata-
logues of each one can remotely be searched irrespective of
location. The TELNET (function) capacity allows the elec-
tronic catalogues of several libraries to be searched. A library
user in the University of Iowa, can easily access and search the
electronic catalogue of the following universities in the USA
(as of August, 1994).

1) INDIANA UNIVERSITY
2) UNIVERSITY OF MINNESOTA
3) PURDUE UNIVERSITY
4) IOWA STATE UNIVERSITY

IMPLICATIONS OF MODERN TECHNOLOHY FOR LIBRARY MATERIALS

Modern technology as compared to the manual system has
implications for the library system some of which are:

1. Enhanced Processing

OCLC and R-LIN (Research Libraries Information Network)
have streamlined the ordering and processing of library mate-
rials. This means that libraries using either of these commer-
cial databases can locate and select materials needed on-line,
send out orders by E-mail to publishers and at the same time
obtain bibliographic records from and add holdings informa-
tion on-line. Acquisition is done on-line cataloguing of
materials purchased are also done on-line.

2. Electronic texts

Most reference materials and textbooks are now moving from
book format to electronic format. For example, the *Encyclope-*

dia Britannica has gone online and is now available on a subscription basis to colleges and universities. Journals are now following suit and soon. Research libraries will subscribe to journals in the electronic format which will be cheaper than the printed format.

3. Non-textual media\Multi-media

Access to non-bibligraphic data is equally important and research libraries are increasingly making such data available to their clients. Examples of such materials are numerical data such as census information, survey research, cartographic data; image data or icons; (photographs and satellite images); textual data such as the full texts of literary works. Such electronic materials can take many forms, including full colour, images, sounds, movies, etc.

IMPLICATIONS FOR LIBRARY SERVICE

1. Information Policy

The emphasis on information policy is now access, privacy and intellectual property. There is a shift in values from anticipatory collection building to meeting identified essential needs; from ownership to access; from the library as a physical entity to an information system remotely accessible; from the library as a provider of external information to intermediary facilitator of access to campus and external information; and from large central databases to distributed database, (Jennings, 1992). This policy is reached because it is believed that quality is measured by client satisfaction rather than by size of collection and budget.

2. Client Expectation

Clients want their access to information to be fast (instantaneous, online), complete (full text, not merely bibliographic) and malleable (downloadable), not just online browsing (Sack, 1986). Clients view the library as a gateway to information rather than a depository of information.

To enhance self-sufficiency, therefore, librarians have to create help screens, online directories etc. to help their clients.

3. Service Support

Technology offers the opportunity to provide and make necessary, services and materials that were not available before. There is need to establish professional\client relationship to make clients aware of electronic and print sources of information and educating clients on how to gain access to them.

4. Document Delivery

With this new technology, document delivery can quickly be done electronically through scanning and document delivery projects like RLG's Ariel and by E-mail.

5. User Education

The new emphasis on user education will be on accessing and obtaining information by providing and understanding the organization of information and the fundamental techniques for accessing it. There should be hands-on training on the application of software and in the use of online and other electronic resources. Information access should be an integral part of educational programs at all levels.

Online guides will show clients the basics of using the library as well as using the online catalog.

CONSTRAINTS TO THE ADOPTION OF THE NEW TECHNOLOGY IN NIGERIAN LIBRARIES

1. Finance

Challenging questions on resource allocation and budget are some of the problems libraries that wish to benefit from the new technology are facing. Right now, only a little percentage of libraries in Nigeria have automated their services, and still

very few librarians are computer-literate. The cost of buying and maintaining equipment (technology costs) and inflation in materials (especially in serial prices) are driving a real budget crisis in libraries especially Academic and Research libraries. Technology has undeniable benefits but it comes with unavoidable costs. For example, in the USA, the typical ongoing annual costs for automated systems alone are US$368,950.00 per annum (Pasting, 1994). Networks, work-stations, CD-ROM players, multi-media etc. all add additional costs never borne by libraries in the past. With the dwindling power of the naira in the world market, Nigerian libraries still have a long way to go as regards the acquisition of this new technology. It is estimated that a Nigerian Library will need for its on-going annual cost the sum of N8.5 million at the 1994 current rate. This cost has nothing to do with the initial cost of buying computers, networking, CD drives and application software.

2. *Communication Links*

Communication links in Nigeria are almost non-existent. To communicate with other libraries and with colleagues within and outside Nigeria, our communication systems need to be improved. Our main communication link within and outside Nigeria is by telecommunication, which is grossly inadequate, inefficient and ineffective at present. To benefit, therefore, a more effective means of communication should be looked into and adopted urgently.

3. *Electricity*

Computers cannot function without electricity and the equipment necessary for this technology can only function properly in a cool (air conditioned) environment. There should therefore be adequate and constant electricity supply. Adequate electricity supply in Nigeria is a very urgent priority if we are to forge ahead technologically.

4. Lack of Infrastructure

In developed countries where modern technology is at an advanced stage, the Federal Government took steps to ensure that this technology developed by providing adequate infrastructures. In the United States of America, for instance, the National Science Foundation Network (NSF Net) comprises the Internet "backbone" (a very high speed network that connects key regions across the country). For the Internet to function, there must be connections between computers locally, nationally and internationally. Connections can be done through any of the following communication media:

   a) Metal wires
   b) Microwave links
   c) Packet radio
   d) Fibre optic cables

The most effective of these, is the fibre optic cables but they are also very expensive. The fibre optic cables should be laid in all States of the Federation from where Research Institutions and Universities can readily tap from. Academic departments may then lay Ethernet cables to connect their personal computers and workstations into a local area network (LAN). This problem should be addressed urgently by the Federal and State Governments of Nigeria.

Computer Literacy

In Nigeria today, about 98% of the population is computer - illiterate. Adequate programmes should be inculcated into secondary schools and Tertiary institutions to address this problem. There should be a continuing education in tertiary institutions to train students and faculty on new methods of searching databases to benefit fully and appreciate them.

CONCLUSION

With the advent of new technology in libraries, the emphasis has now shifted from ownership of needed materials to access.

Thus it is necessary for library staff to work more closely with clients to support their research. It can, therefore, be concluded that the key to successful integration of technology into library operations is adequate equipment, software, training for library staff and clients. Training for both staff and clients should be an ongoing process.

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