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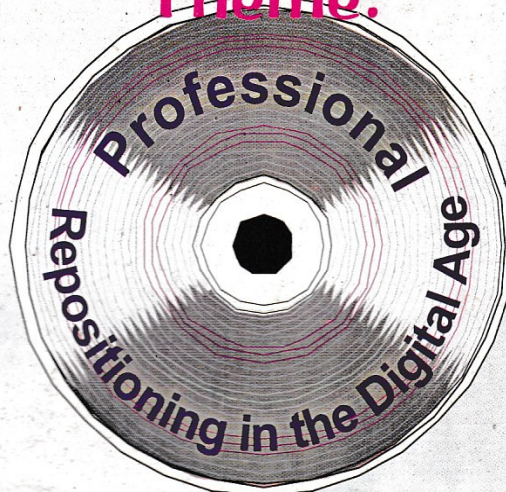
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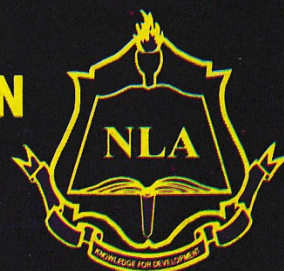
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Nigerian Medical Libraries in a Digital Age

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Digital Age; Medical Libraries; Nigeria

Abstract

The paper examines how digital systems can impact medical library services. Digital library is defined and the features of digital medical libraries highlighted and discussed. The paper argues that the level of digitization of Nigerian medical libraries is insignificant while compared to those of the developed world. It insists that Nigerian health libraries must of necessity get hooked up to the Internet. The advantages and disadvantages of digital medical libraries are discussed. A key advantage is that information in a digital medical library can be read, communicated and utilized without being subjected to space and time or by the number of users. It enables access to original scientific information. It provides a repository and distribution mechanism for multi-media learning resources. It can be built into distant learning, adult education programme or industry research. Inadequate skill sets can be a major barrier to maximal exploitation of digital resources and facilities. The implications of digital systems for the librarian, library and parent organization are discussed. The paper concludes that the low-level digitalization status of Nigerian medical libraries can be used as a strategic tool in avoiding the pitfalls of digital medical libraries in developed nations of the world.

INTRODUCTION

Libraries everywhere are increasingly affected in all their functions by the rapid evolution of the digital age. The

World Wide Web and the Internet have greatly enhanced access to a variety of information resources (Ibegwam, 2002). They have also provided for many new and complex challenges and problems to the libraries, their creators and users. The critical issue is ensuring an effective and efficient flow of information from the generators to the users of information in the digital environment. The effective and efficient use of electronic resources, services and networks is also of paramount importance. This is a complex communication chain with libraries playing an important role.

A library is a body of collected information brought together for the purpose of knowledge dissemination and utilization (Clark, 1999). Library collection evolves throughout the ages. (Su-shing Ghen, 2003). The ancient library structure of handwritten books changed significantly by the introduction of the printing process in the mid-15th century. The printing process was capable of producing multiple copies of the same text. The proliferation of printed books for use in universities and learning centres drive the development of these institutions in which books were collected and stored.

In the digital age, a similar revolution is stimulated by the advent of digital information in reshaping the library structure. Today's libraries contain materials in many different media and formats. In addition to printed materials, libraries collect films, videos, filmstrips, computer disks, sound recordings, digitized files, and various kinds of media records. In spite of the changes in library operations and structure, the basic functions of the library, which include acquisitions, collection, indexing, organization, dissemination and utilization still remain.

In the information age, technologies have the capabilities to potentially expand the life cycle of information into many new dimensions, and change the operations and structures of existing libraries as one of the oldest social institutions.

The role of the libraries brings a number of new complex requirements. (Ibegwam, Greeves, & Adesanya, 2002). Due to the complexity of these requirements, it has become important for the libraries and other information specialists to be continuously abreast of new methods and techniques as well as new trends and approaches (D'Alessandro, et al 2000). Thus, for the medical librarian and all information professionals there is constant need to update their professional knowledge and competencies.

ORIGIN: Some scholars (Ojokoh and Falaki 2003) are of the opinion that the origin of the word "digital" can be traced back to H.G. Wells and other authors who caught the imagination of millions with speculative

writings about *world brains* and similar fanciful devices. These authors sold the idea of computerised library.

Added to the above is the role of scientists like Bush who according to Ojokoh and Falaki (2003) played a part in the origin of digital library by writing about "memex", a mechanical device based on microfilm technology that anticipated the ideas of both hypertext and personal information retrieval. The first real world applications of computers to libraries began early in 1950's with IBM and punched card applications to libraries technical service operations, and with the development of the machine readable catalogue (MARC) standard for digitising and communicating library catalogue information.

(Licklider, 1965) coined the phrase "library of the future" to refer to his vision of fully computer based library and later (Lancaster, 1978) wrote of the soon to come hyper space. (Harter, 1997) wrote about other concepts coined to refer to the concept of digitized library to include "electronic library", "virtual library" "library without walls" and "bionic library". Recent use of the word can be traced back to agencies like the National Science Foundation, the Advance Research Project Agency, and the National Aeronautics and Space Administration in the US in 1994. These agencies granted 24.4 million dollars to six universities for digital library research.

DIGITAL LIBRARY DEFINED

Billys, (2003) posits that "digital library is still being defined very much with respect to how it is perceived in the mind of beholder". He further stated that for the majority of participants in the technical construction of the infrastructure that provides access to information on the Internet or within the world wide web, and for most of the users of that word, a digital library is simply a collection of information stored in electronic format. He concludes by saying that the root of the digital library lie much more deeply in the traditional library than generally assumed and its users are likely to be more typical, in need and habit of traditional library customers than might be imagined.

Falaki, (2003) describes it as generic name for dynamic, federated structures that provide intellectual and physical access to the growing worldwide networks of information encoded in multimedia digital formats. To Martin, etal (2003) it is simply a library without walls.

Graham, (1995) describes it as a collection of electronic information organized for use in the long term.

Keller, (2003) states that even though the word *library* conveys the idea of a resources providing access to information, but in the digital realm, a library is much more than this. It is an interactive vehicle for instructional learning; provides access to course materials, such as syllabi and other instructional materials.

Kuriemuir, (2003) sum up the debate of what a digital library is by defining it as a library where the services and projects interact in technical, personnel and promotional way. He adds that it is where the majority of the activities listed below are carried out:

- ◆ Digital library service including creation, maintenance and enhancement.
- ◆ Evaluation of digital library projects, services and programming.
- ◆ Consulting of digital library matters.
- ◆ Developing digital library demonstrations - usually but not always as part of a funded project.
- ◆ Research in a variety of aspects of digital/electronic library matters.
- ◆ Training in some aspect of digital library usage.
- ◆ Fund raising for the library
- ◆ Digital library project and service coordination – author as the sole partner, or the lead partner of the consortium.
- ◆ Digital library services and project-oriented publicity and promotion.
- ◆ Organizing and promoting digital library events.

Daniel, (2002) writing on virtual library for Nigerian Libraries describes digital library as synonyms to electronic library, community network or library without walls. He also describes it as a child of necessity arising from the need to use technologies in accessing the world information overload or information explosion for human survival and development. He defines it as collection of library resources in electronic/digital format at various locations which can be assessed and used with great ease using computer information and telecommunication technologies for the purpose of teaching, studying, research, learning, leisure and decision making.

FEATURES OF A DIGITAL MEDICAL LIBRARY

Through knowledge discovery and visualization tools, information becomes knowledge. A digital library has

more collaboration, explanation, interpretation, and presentation capabilities than traditional libraries. Information content can be processed or synthesized by computers into knowledge for the user.

- φ Implementation of a digital library will require two kinds of tasks (establishing the repository itself and implementing the tools for use with it and other kinds of new commitments).
- φ Digital library will be manifest to user as collections of information existing in various places and accessible through the use of widely available tools.
- φ Libraries need not acquire all electronic information as some will be found somewhere on the network while some will be repository at the institutions that are responsible for its generation.
- φ There will be many electronic storage repositories, responding both to requirement of redundancy and to the individual needs of institutions. Also in contrast to the print collections, it is unlikely that there will be a high degree of content duplications across many electronic repositories, since for most purpose existence in a single place allows worldwide access.
- φ Mega document contents containing many gigabytes of information, growing quickly by millions of electronic document will be a feature of a digital library.
- φ Source and potential participants will comprise of libraries the world over that have the technology for digitization. Most of these libraries already existed in the developed countries of the world.
- φ **Back up mechanisms:** This must be in place for the smooth functioning of distance learning. Backups must be multi generational, using remote storage, with regular dissimulation and tests.
- φ **Staged Access:** Staging refers to the prioritized use of different mechanical methods of storing data as if waiting to be recalled. Alternatives for providing immediate online access to the enormous potential volume of scholarly information need to be provided. This alternative can include magnetic disks, optical disks and juke boxes remote storage, and automated ware houses of magnetic tapes.
- φ **Data structure standards:** This will determine whether an information simply exists as first created or as complementary information (meta

data).

- φ **Authentication of integrity:** Implementation of authentication and integrity techniques that combine mathematical security with ease of use, public trustworthiness and privacy protection. This will help in meeting users expectation.
- φ **Redundancy:** Establishment of standards for the number of repository location is necessary to assure long term existence of specific electronic information and access to it.

MEDICAL LIBRARIES IN NIGERIA

There are about 32 medical libraries in Nigeria. The collection of these libraries are predominately in print format (journals and books). However, the audiovisual library is part of most of this medical libraries. Also, another common feature in most health science libraries in Nigeria is the presence of Internet connectivity, CD-ROM and floppy diskettes which are viewed via a personal computer. The trend also is complete automation of library processes using numerous library softwares that are now available in the emerging and exploding Information Technology market.

The level of digitisation of medical library when compared to those of the developed world would appear insignificant. However, even though Nigeria health libraries are at the other side of the digital divide it can be used to their advantage by borrowing from those libraries all over the world that have success stories to tell and avoid the pitfalls of those that ran into problems in the process of digitising. A close monitoring of digital project of medical libraries in the developed nations will constitute a good dividend as full-fledged digitization is considered by the Nigeria health libraries.

A good example of a success story is The Red Sage Project of the *Library and Centre for Knowledge Management*, (University of California). The project electronically distributes journal directly to individual physicians and faculty. This was done through computer desktops utilizing automated alerting based on users interest profiles. The experiment provides high-resolution bit-mapped images, grand-scale figures, article harder information and the full fett of each article, (Martins et al, 2003). The reason for the project was to explore the technical, legal, economic, business and social issues surrounding the delivery of scientific, technical and medical information in a network environment. However, due to the fact that the volume of information that is being produced exceeds the ability

of an individual to separate the wheat from the chaff, the Centre went further to develop alternatives to existing tools and design. Innovative new tools for network information discovery and retrieval were used. The centre is even exploring the technical feasibility of using mosaic and www integral access between published journal literature from the Red Sage Project with the developing monolithic data sets of biomedically-relevant structure information. Their works has shown that the Medical Library of tomorrow will bear little resemblance to the library of today. This is because collections will no longer be limited to print and other types of static information. In the digital age, most collections will include a combination of raw scientific data, electronic journals, books, interactive instructional textbooks, digitized video and audio and other types of hypermedia.

In Nigeria, the health libraries can begin by the computerisation and automation of the information already present in their libraries. These will include putting on-line their catalogues, as well as the digitization of locally generated medical records and dissertation emanating from staff, graduate and postgraduate students. The process of their digitization will constitute Nigeria's major contribution to the digital library of the world.

Finally, Nigerian health libraries must of necessity get hooked to the Internet. The librarians must be conversant with medical web sites and their peculiar features and information to be derived from them. This will enable them act as digital reference librarians to their users when digitisation becomes the norm.

ADVANTAGES

There are several benefits to be derived from a digital medical library. These include the fact that information in the library can be read, communicated and utilised without being subjected to space and time or by number of library users.

Arms (2003) adds that the digital library has added advantage of enabling access to original scientific materials. For instance, medicine could be studied from original papers, research reports, data sets etc which is fundamentally different from learning information based on distilled materials such as textbooks. As the volume of medical information that is subsumed into undergraduate courses has grown, universities have moved from the ideals of liberal education in which students explore a subject through reading original materials to heavily structured curricular. The digital

library will also provide faculty with materials used in the preparation of good lecture materials.

Arms (2003) also identifies the following, as potential advantages of a digital library.

1. Provides communication among student and faculty: Communication can be within a university or college, or across organizations.
2. Delivers specific education materials: An increasing variety of educational materials, which include computer programs, data sets, various categories of multimedia items, etc. Computer networks and digital library provide cost effective way to store, retrieve and deliver their materials.

A digital library can provide a repository and distribution mechanism for multi-media learning resources. It is also an opportunity to overcome physical and geographical barriers and become integrated more closely with other functions of undergraduate education. The library may be brought into the classroom and study sessions. It may also be seamless by linking to web-based syllabi and computer based learning modules. Apart from the above, the following are some other benefits of having a digital library as posited by John Kuriemuir(2003).

- * The skills and experience of staff can be used across a range e.g. projects, and the non-project components of the library as opposed to being used on one discrete project. This benefits both the development of the staff and the development of projects and services.
- * The digital medical library should have more "clout" within the host institution, and is therefore able to fight for better (adequate accommodation and other institutional resources).
- * In addition to these, a fundamental breakthrough presented by the presence of digital infrastructure is the destruction of traditional notions of time and space as they relate to library access. The establishment of a digital library for an institution can create significant and compelling economic effect like the infrastructural requirements of the digital library are very close, and in some ways identical to those of electronic commerce. These criteria include locating, evaluating, retrieving, and paying for information.
- * The library also has the capability of being built into distance learning, adult education programs, or industry research.

- * The existence of a digital medical library can help in the development of a community where they can cooperate in both education and research. In a similar manner, students can interact with others from around the world. There is a continuing development in collaborative tools that allow faculty and students to distribute their work to others, including annotations and comments.

The above advantages are pluses for digital medical libraries. The digital library rather than competing with or potentially supplementary the profoundly system of scholarly communication which is the provenience of a medical library will complement the relatively healthy industry of textbooks and instructional materials.

If a production-oriented undergraduate digital library enterprise is to be launched, there is need for policy on the infrastructure expectations and design implications. This policy should be carefully and clearly, articulated, and periodically revisited in light of development in the networking industries.

It is also noteworthy that a digital library in support of medical education is likely to be an extraordinarily attractive environment to explore ways in which sophisticated digital multimedia and networked information can enhance the processes of teaching and learning. Therefore terming it a "Library" may be somewhat misleading.

Given the broad-based constituency of medical professionals and students in Nigeria, broadband network services to homes and cottage hospitals is of critical importance.

DISADVANTAGES

Digital medical libraries have the following disadvantages:

Non residential colleges and universities will face particular serious access problems. The issue will be infrastructure to support not just institutions of medicine in Nigeria as specific sites, but all members of the institutional communities wherever they learn. There is need for computer literacy if students and staff are to take advantage of the service.

Implications

Libraries and universities have a stake in helping electronic publishing to succeed and therefore have an interest in establishing secure digital research libraries. (Graham, 2003).

Other areas with implication for the libraries are access tool and policies:

- **Using and retrieval mechanism:** The full panoply of present access tools must be supported by a digital research library e.g. catalogues. This will encompass the "granularity" of documents e.g. how can one retrieve a chapter of a document (e.g. a chapter of Grays Anatomy) when the full document may be of substantial size. Must documents be pre-coded (or pre-marked to allow such granular access or access time mechanism be made available).
- **Cataloguing:** in relation to print documents abstracting and indexing services by library catalogue, with attendant rules and procedures to ensure consistency and accuracy. Will this work with the digital library?
- **Remote Access:** A digital library in Nigeria should from the outset intend to access from multiple remote locations. Procedure for dissemination of such catalogue records will be needed. This must be included in the policy of the library.
- **Fees and Freedom:** Fee charging techniques, including billing must be defined. In addition, privacy preservation for users and copyright protection for intellectual property holder must also be taken care of.

Organisational commitment will involve the creation of the systems department or the expansion of some of the departments to include the new range that come with digitization. It also involves the employment of competent staff or training or retraining of old staff to make them ready for the new challenges.

Fiscal commitment through continuity in operational funding will ensure the permanence of the existence of a digital library. Thus fiscal commitment will have to be part of practical steps taken by an institutional to show commitment which must be clearly and publicly made if scholars and other libraries are to have confidence that the given digital library is indeed likely to exist for a long term. The task of setting up of digital library according to Graham, (2003) calls for informed commitment.

For the libraries, the digital age has the following further implications:

- ♦ The librarian should be in the game in a big way. This is because as the Internet has become so large an information space that it requires systematic and authoritative management. The librarian's skills properly translated, will become crucial for ensuring that the authoritative digitally stored knowledge is what is accessible to faculty and students.
- ♦ The librarians and libraries will maintain and manage unique collections of objects even after it has been digitized and delivered to the world on-line.
- ♦ They will also provide help and assistance as they always have in finding, evaluating, and understanding the information that the digital world has provided. This means less time will be spent in developing collections and much more developing on-line guide, to subjects, topics and resources.
- ♦ Less emphasis will be placed on volume of material provided by a library and more on what volume of materials each library clients can access.
- ♦ In addition to the above, Lombardi's Rules for digital survival created from 30 years of engagement in the academic computer revolution contains some implications for Medical libraries that seek to remain relevant in the digital age.
- ♦ Since geography will become increasingly irrelevant access to content will become the primary mantra of all library work.
- ♦ Helping clients find resources in a digital chaotic world is the first priority, using the rare book might be the second.
- ♦ Expect expensive upgrades when vendors promise seamless access and modular computability with any future developments.
- ♦ Being first to invent large-scale digital library projects is for those with money, to lose. If it will take ten years to deliver value, let someone else invest in it.
- ♦ Nothing currently defining the Internet will remain recognizable after 5 years. Therefore the librarian should be on the alert and knowledgeable on recent events as it concerns the digital age.
- ♦ Invest in unique products only when you have comparative advantage and someone else pays for it.

- ♦ The Librarian should be prepared for her products to become obsolete just when it works well its use.

CONCLUSION

The digital age is with us. Digital Medical libraries is an ever increasing feature in the developed nation. Nigerian Medical libraries are on the other side of the divide. This position can be used to her advantage by ensuring that they avoid the pitfalls of digital medical libraries in the developed nations when they finally get there. Secondly, since the digitization processes is still at the primary stages in Nigeria, it may be worthwhile for the librarian to upgrade their knowledge of the digital age and what to expect so as to have a head start in readiness for their changing and evolving role in a digitized environment, where more information processes will be finding ways to ensure faculty needs to discover and evaluate materials and medical sources of materials are met. The communication among students and faculty which will be enhanced by the wall less library can also be exploited by the health libraries especially in the selective dissemination of information to staff based on their staff profile.

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