AN OVERVIEW OF DIGITILISED LIBRARY AND INFORMATION SYSTEMS AND SERVICES

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Abstract

The paper traces the historical development of Library and Information systems; from manual to automation, then to digitalization. The paper posits that, today, the convergence of Information and Technological revolutions has in effect turn Libraries from "real" to "virtual reality".

Highlighting the characteristics, advantages and disadvantages of digitalized Library and Information systems, the paper concludes that, because digital information systems and services is not limited by size of resources, content, users, time and ownership, Nigerian Libraries should adopt a digitalization policy

1.0 **INTRODUCTION**

The term digitalized library or Electronic library that many years ago sounded futuristic and utopian; something out of science fiction comics is no longer a mere concept. It is now a reality not only in the developed world but very much present in the developing countries.

Many scholars have stylistically defined the term in different ways, Muhammed (2003:2) has however summarized the various definitions and beautifully states that the term is conceived as an organized collection of documented information resources (text, numeric, images, statistics, sound, software, etc.) not limited by physical structure and printed format but also including electronically stores information and information resources accessed physically and remotely irrespective of the time and the location of the user and/or the information resources with the assistance of information and communication technologies.

The journey so far to this present stage of digitalized library and information system has been very colourful and eventful. The journey has spanned more than three centuries. There was first, as noted by Getz (1997:81), the printed materials, then the audio visual and the mechanization of the retrieval process. After which came the Information Technology

(IT), Information and Communication Technologies (ICTs) and subsequent automation process. And here now is the digitalization.

Therefore, to provide a comprehensive survey of digitalized library and information systems and services, the topic is critically looked at from two broad perspectives. The first is the technology breakthrough and subsequent technological development. The second is the information revolution. It is evidently clear that it is the convergence of the above two developments that gave rise to the library of the future – the digitalized library.

The discovery of writing and paper, and the subsequent inventions of printing press and the rise of publishing in the 15th century brought radical changes to the world, especially in terms of information, learning and knowledge. By 17th century, printing shops and publishing houses had become numerous and the number of published books increased immeasurably. By this period formal schools had also taken firm root. People became much more conscious and aware. They also became anxious and eager to find out and learn. In fact this period witnessed the rise of very prosperous and literate societies.

The Industrial revolution that occurred in the early part of 19th century brought along with it other revolutions, prominent of which are Agricultural revolution and Information revolution. Thus, the establishment of numerous printing presses/publishing houses, the establishment of different types of formal schools and the emergence of very prosperous and literate societies, served as very important ingredient for the already existing libraries to flourish.

Libraries began to collect and store Monographs, Manuscripts, books and other form of publications. It was not until when libraries saw the tremendous annual increase of these publications that they began to devise systematic ways of organizing and retrieving library materials. Consequently, many systems of organizing and retrieving library materials were

put in place. The most important was of course the card catalogue and the classification systems. Other forms of organizing and retrieving systems were the clippings and the scrap books, and of recent the Indexing and Abstracting, and compilation of bibliographies. All these activities were done manually prior to the advent of mechanization.

The growth in world population, the diversity of human needs and the developments brought about by the Industrial Revolution, especially in the area of technology and division of labour necessitated the need to come up with technological devices that would further simplify and ease human activities and undertakings. This notion gave birth to mechanization of society. Oruma (1978:16) notes that Mechanization of various sections of society began in the early part of the 20th century. The process afforded machine-readable services to be provided in almost all sphere of life. In this period mechanized retrieval systems were developed for technological record officers, statisticians, meteorologists, sales officers and military science specialists.

The literature explosion, the increase in the number of people using libraries, and the high demand of library and information services rendered the manual system of organizing and retrieving information ineffective. So, libraries embraced mechanized information retrieval system. Consequently, various mechanized information retrieval systems, such as the centre-punched card system and the edge-punched card system were developed. However, one of the most important mechanized information aids that have found increasing application since the upsurge in information retrieval services was the feature card system, popularly known in America as the peek-a-boo or in Britain as the optical Coincidence System.

Before this system could be used, data must be input into the system. The Inputting requires first and foremost analyzing subject content of a document with the view to

developing the words that best describe the subject or topic of the document. Feature cards are then assigned to each keyword. The feature cards have numbers on them. Therefore, the numbers on the feature cards are drilled or punched in order to signify a document. The whole process called for Indexing of library materials which in turn saw the development of thesaurus and other control vocabularies.

To retrieve data from the system, the enquirer's information need must be expressed in the language of the controlled vocabulary. The feature cards that correspond to the question terms are then picked out of the tub and read on the reading units. The system output is in the form of references to documents on the 10.1 cm by 15.1 cm document cards which contain all the bibliographic details including in some cases an informative abstract.

Although this mechanized information retrieval system was an improvement over the manual system, but because only input and retrieval processes were mechanized as against other processes, such as acquisition, circulation, cataloguing, e.t.c and because of the high demand of information and the number of people wanting to use the system, the system was not able to cope with the challenges of the time, hence the system was therefore short lived. However, the mechanization soon became a prelude to computerization. Large frame computers were developed and used in inputting processing and retrieving of information. Steig (1990:46) rightly noted that never has human kind devised a more powerful or versatile machine than the computer. Computers permeate all aspects of life from accounting to Zoos, not to mention…crime and Education.

According to Adams (1986:1), computer application in library activities first emanated from the USA in 1950. By 1960 computerization of libraries had gone very far especially when mainframe computers in large organisations were used to facilitate database

development, management and information retrieval. The advent of micro and later personal computers (PC) further facilitated and simplified the computerization process.

The above developments soon enable quick change from traditional and mechanized system of processing and retrieval of information into computer compatible systems. Automated searching of files, coordinated indexing, and control vocabularies were introduced in response to the urgent need to create easy access to the contents of scientific journals. Automatic abstracts, or summary of documents were then developed to further simply access to research findings.

In the late 1960 and early 1970 massive collection of documents were transferred to databases or converted to non-print forms; various searches could then be done by computer. It was also in the late 1970s that library application software debunked. The software were developed to further provide effective and efficient automation process and also to provide enabling conditions for resource sharing and networking among divisions or departments/units of libraries, and/or branch libraries as Local Area Network (LAN), and among other libraries as Wide Area Network (WAN).

Computing and telecommunication use to be quite distinct industries, involving distinct technology. Now, observed Tedd (1993:4), they have converged around certain key activities. Prominent among these key activities is the processing, transforming various data into information and then transmitting such information to various places – "Doctors without frontiers". This convergence of the most prominent component gave birth to what is now called Information and Communication Technologies (ICTs). ICT is simply referred to the Computer and telecommunication devices used for data and information gathering/acquisition, processing, storage retrieval, dissemination and transfer to the relevant users. ICTs devices include: Telephone; Mobile Phone, Private Automatic Box Exchange

(PABX), Photocopier, Scanners, Fax machines, Close circuit television sets, cameras; conventional digital camera; microwave link systems and very small aperture terminals (v-sat), Computers and Internet.

The very many varieties of ICT devices mentioned above, though not exhaustive, no doubt proved capable of coping with the exigencies of the 21st century no matter the size and complexity of data and information handling capacity is required. Therefore, the application of ICTs to library services has no doubt greatly transformed the nature and pattern of information handling, services and cooperation in libraries and information centers worldwide. No wonder Zaki (2000:113) remarks that ICT is revolutionalising librarians at a high speed. The ICTs have undoubtedly provided opportunities for the provision of variety of information services. The most prominent of the information service offered by ICTs is the internet oriented services.

The Internet is the networking of various computers already networked and scattered all over the world. The net workings of these computers have effectively been described as information super highway. The ICTs device provides rapidly growing collection of information to topics ranging from medicine to science and technology. It features extensive materials on the arts, recreation and entertainment, shopping, traveling, research materials, etc., virtually everything one can think of. Mohammed (2000:75) noted that the Internet is today a global network currently linking over 100,000 networks and spanning over 150 countries.

The Internet provides an opportunity for libraries to acquire/generate tremendous information resources quickly and faster. On the spot orders to publishers and producers of audiovisuals, databases, etc. can be done easily. Libraries using appropriate commercial databases, can locate, select materials and send out orders by e-mail. Processing of

information, as well as storing and transmitting are achieved much faster than any ICT device. Service provisions in the Internet also become much easier and faster. Reference and information services through access to current dictionary, encyclopedia, maps, databases, etc. are provided.

And so now, as noted by Otim (2000:68), a new period had dawned- the age of digitalization; the age of instant communication; and the world of the global village. There is a new sense of magic in the air at least for those aliens from the old industrial past making their first encounters with this brave new cyber world. The process of translating a piece of information be it in text, numeric, picture or video, statistics, sound and software into bits and transmitting such to every corner of the world instantly has no doubt brought end users to vast and variety of information resources, rather than delivering the end users to a physical set of resources.

Choo ming (2002:26) notes that with the availability of a myriad of digital materials on the Internet, more libraries are jumping on the bandwagon, with the aspiration of becoming digital libraries. Digitalization projects in many big libraries all over the world are stimulated by recent advances in digitalization and scanning technologies. Initially all documents were manually re-keyed. This slow, tedious and painful process was however enhanced by the high speed optical character Recognition (OCR) systems.

Nancy Schiller, according to Daniel (2002:56) was one of the first writers to use the expression, in 1992 ‘Virtual Library’, which has today assumed some many other names, such as digital library, electronic library, community network, and sometimes simply called library without walls.

It is called ‘Virtual’ because a traditional library is simply a place, i.e. building or room where Information resources are kept and used for knowledge acquisition and learning. The

place can be ‘real’ as in the case of building or room (non-virtual) or ‘Virtual’. The concepts of ‘real’ and ‘Virtual’ are used more in a scientific rather than in the literal sense. Real means tangible and capable of being felt while virtual denotes a representation of reality. This has given rise to the concept of Virtual reality to which the ‘Virtual Library’ idea subscribes. Thus, the real world of the library is perceived in virtual space.

Therefore, in a good electronic wide area networked library, the user enjoys the euphoria of being in distant libraries, and yet he has not physically moved. Oketunji (2001:32) has graphically demonstrated this when he said ‘then a library user in Nigeria can ‘fly’ through the internet super highway, to the Library of Congress in Washington DC, transact business with the library staff there and at the end ‘return’ to his seat in Nigeria without in reality physically leaving it! Indeed it is an experience of virtual reality!!

From the above foregoing, the following characteristics could be attributed to Digitalized Information System (DIS).

2.0 CHARACTERISTICS OF DIGITAL INFORMATION SYSTEM AND SERVICES

A typical digital Information System and Services is characterized by the fact that it is not limited by

(i) Size of resources

(ii) Content

(iii) the nature of physical (tangible) and/or electronic information resource (Intangible)

(iv) the type of users

(v) time of access, and

(vi) the need for and nature of use

(vii) ownership

From the above discussion and listed characteristics of a Digitalized Information System (DIS), the following advantages could be derived.

3.0 ADVANTAGES OF DIGITAL INFORMATION SYSTEM AND SERVICES

1. While the conventional library system allows the removal of the information resources from the shelves for use whenever and later returned, the contemporary digital information system and services allows for the copying of the information resources to the user's desire destinations; diskette, C.D., or stored in the user's personal computer.
2. Apart from providing access to information resources the digital information system and services also allows the users to perform and enjoy other services such as e-publishing, e-mail, e-journals, e-books, e-commerce, etc.
3. Electronic information resources can be sorted, transmitted and retrieved easily and quickly.
4. It is a two-way system of information delivery and transfer.
5. Electronic information resources can be linked and made interactive with cheaper access.
6. The ideal library cooperation is much more realizable with Electronic Information Resources (EIR). Typical examples of this trend are the applications of the Internet and World Wide Web (WWW) to electronic publishing and access to online information.
7. Digital Information Systems and Services reduce cost significantly especially in term of building/extension of libraries, space, personnel and redundancy of collection.

8. The Digital Information Systems and Services also offer fees-based and free services. Example of free services enjoyed in digital information systems and services is the distribution of some journals electronically. Hurd and Waller (1997); online contents of Databases.

The above mentioned advantages of Digitalized Information System (DIS) seem to make the system perfect. However, following the popular saying that for every advantage there is disadvantage, the following disadvantages have been found to be apparent in the system.

4.0 DISADVANTAGES OF DIGITAL INFORMATION SYSTEM AND SERVICES

1. Contains so much information resources that are poorly organized, due to poor and incorrect cross-references and links, hence accessibility, navigation and retrieval become difficult and thus produce unsatisfactory results. It is good to state here that the creation of search enquiries is greatly enhancing accessibility and retrieval.
2. Lack of well comprehensive, easy and quick retrieval device. Furner (1998:28) notes that search tools are inadequate to facilitate speedy information retrieval.
3. Although there is so much information in digital Information systems and services. Much of the desired information may not be available on the internet or in public domains due to copyright problems. Valausuas (1995:133) notes that because of this; less than 1% of all information that exists in paper is available electronically.
4. Although Digital Information Systems and Services reduce cost significantly in terms of building, speed, etc., digitalization is still not a simple task. Mackie-

Mason and Jankovich (1997:281) observe that every step that leads to conversion and digitalization is still very expensive not to talk of the equipments.

5.0 CONCLUSION

The old ways of processing, disseminating and sharing of Information resources have today been replaced with global resource sharing, the principle of one product for one user at one time has been replaced by networked products that support multiple users simultaneously and allowing multiple access to multiple resources from any workstation. The Internet has now become the *de facto* virtual library with as many as 10,000 search engines offering Information that can be downloaded from some 320million web sites. Therefore, as we try to adjust to the new world of cyber space, it is very important to remember the journey so far. The ICT revolution is no doubt offering us the opportunity to, from living thousands of miles apart, come much close together in a shrinking global village. The new revolution now has within it the capability to connect every one every where instantly.

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