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THE ADOPTION OF ICT FOR LIBRARY AND INFORMATION SERVICES

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**THE ADOPTION OF ICT FOR LIBRARY AND INFORMATION SERVICES AT THE
FEDERAL UNIVERSITY LIBRARIES IN THE SOUTH-EASTERN NIGERIA, A CASE
STUDY OF FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI (FUTO).**

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Abstract

The paper presents the adoption and use of ICT in library and information services in Federal University of Technology, Owerri (FUTO) Library. The historical development of the ICT Unit of the Library, the structural organization, the ICT facilities, hardware and software available, the offline and online databases and services available as well as the automation process involved were all discussed. The challenges towards the provision of effective and efficient ICT based services in the library including those of funding, ICT policies, environmental challenges etc and the prospects including a tremendous increase in the number of ICT experts at all levels of the library staff, improvement in the provision of ICT infrastructure, development of institutional strategic policy on ICT in FUTO, increase awareness and commitment in ICT among policy and decision makers etc believed to result in prompt and timely information delivery, global access to information and ease of use among others were also identified.

Introduction

The global information revolution of the 20th century made manual systems of delivering information services in the libraries especially academic and research libraries mundane, clumsy and inefficient, though the era of total electronic or paperless libraries is yet a mirage. (Aguolu and Aguolu, 2002). The bulkiness, growth rate of information and difficulties positioned by updating of manually based systems makes it difficult for effective services in modern time. (Ikem and Ajala 2000). Librarians and information professionals are then challenged to create "information systems for the collection, organization, dissemination and preservation of information and new knowledge regardless of format" (Gbaje 2007). This new age of information offers possibilities for the future with information delivered in different formats limited only by the boundaries of our imaginations. Also the potentials of the electronic network are breathe taking-the prospect of change as wide spread and fundamental as the agricultural and industrial revolution of the earlier eras.

Therefore, as there is seemingly no option to the integration of ICT in library services especially in the academic libraries, many libraries all over the world started making attempts to embrace ICT in their services. Carr (2006) informed that some issues have affected the ideology,

operations and services of academic libraries. These include forces of competition, advent of information in electronic form and the changes in users' expectations. The use of information resources in electronic form and application of internet became a way of life in 1980s and 1990s respectively. Invariably the focus of academic libraries moved from statistics of users visiting the libraries to providing the desired services beating space and time.

There has been documentation on universities in Africa and beyond on the use of ICT for library operations and services. The use of ICT in African university libraries could be traced to 1970s though successful implementation was achieved from 1980s and was consolidated in the 1990s (Chisenga, 2004). Adeniran, (1997) reported the use of ICT in libraries in Botswana, Chueni (2001) revealed its use in University of North South African. Slam and Islam (2007) elaborated on the use of ICT in Bangladesh library which was pioneered by the International Centre for Diarrhoeal Diseases Research Library and the Agricultural Information Centre. ICT facilities used in universities in West African Sub-region was compiled by A Samoah-Hassan (2002). A summary of their findings revealed that not only did university libraries in Africa embrace ICT pretty late, the pace of its development remains slow though some remarkable progress has been made since the late 1990s.

National and regional information abound on the use of ICT in Nigerian university libraries. Kenneth Dike Library, University of Ibadan championed the use of ICT in library operation in 1975 when computerized serials catalogue was produced. In 1978 Union List of serials was produced, an initiative of Committee of University Librarians of Nigerian Universities (CULNU) (Ikem and Ajala 2000). Information on the adoption of ICT in all types of libraries in Nigeria has been documented by Akinyotu (1977), Ifebuzor, Inegbebor & Awaritefe (1977), Lawani, Azubike & Ibekwe (1992), Alabe (1993), Igbeka (1998), Abolaji (2000), Oni (2002), Akinade & Ogunyade (2002), Oketunji, Daniel and Okolie(2002) Idowu and Mabawonku (1999), Anunobi (2004), Anunobi (2005), Bozimo (2005/2006) and Anunobi and Nwakwuo (2008). Challenges of inadequate funding, shortage of ICT skilled staff, inadequate telecommunications infrastructure and power supply as well as sustainability challenges trailed the totality of the entire literature.

The above literature also show that different libraries have had different levels of ICT application as each has both happy and sad stories to tell. The situation of ICT application at the Federal University of Technology Owerri (FUTO) Library is undoubtedly courageous for the entire country. With this documentation, libraries which have taken the bold step will appreciate the efforts of their partners while those that are yet to embrace the prevalent ICT application will be encouraged.

Historical Development of ICT Unit of FUTO Library

The Federal University of Technology Owerri (FUTO) library was officially opened to readers on the 9th of November 1981 though the university itself was established in 1980 by Decree 13 of July, 1980 of the Federal Republic of Nigeria. Prior to 2001, the Library operated print operations and services though a learning resource centre was there since 1986 to provide audio - visual services, which augmented the print services. The first step to adopt micro computer in library operations was in 1994 when the Federal Government through the National Universities Commission initiated the provision of global library resources to Nigerian universities. Consequently, a standalone computer with **The Information Navigator Library**

Software (TINLIB) was provided for all the federal university libraries in Nigeria. This triggered off a new mode of cataloguing and classification, acquisition and circulation as well as other services in these universities including FUTO.

Between 1998 and 2000, FUTO library was at a cross road with respect to ICT adoption in its operation since the high expectation for TINLIB was met with frustration. However in September 2001 the 'Information Technology (IT) Unit' was created to assemble all audio-visual resources and begin the computerization of certain aspects of the library services. One unit computer system was provided for the take off in the Unit. The Unit became operational in January 2002 at a one room office in the Pilot Plant Library (PPL) (a building not originally intended for the library but temporarily used for library since the main library building was yet to be built).

With a staff strength of three, a plan of action was drawn namely – inventory of both low and high technologies in the Library; automation of the Library; provision of Internet facilities and digitization of indigenous resources in the Library. The inventory was taken within few weeks of the inception of the unit and all the resources assembled at a convenient place in the (PPL). Much could not be done by the Unit due to space constraint, but using the provided PC, the condition of all CD-ROMs acquired by the Library was ascertained and faculties were encouraged to peruse them. The Unit's operations and services became more visible when a cubicle was constructed for its use in 2004. Consequently the unit changed its name from Information Technology (IT) to Information and Communications Technology (ICT) Unit. Staff strength was increased to eight and they were dedicated to achieve the stated objectives. Presently, the Unit has staff of various categories, ICT facilities in different forms ranging from computers, printers, scanners, servers, Internet connectivity etc. The unit has fully automated some operation and services of the library, digitalization is in progress, and other services such as web browsing, CD-ROM services, OPAC services, online and off-line database searches etc are all obtainable in the library. The paper aims to show the success of the Library ICT adoption with a view to encouraging libraries that are embraced ICT application and those that are yet to do so.

Structural Organization of the ICT Unit

The structure of the Unit was drawn to ensure systematic work flow which will ensure a complete ICT driven library operation. Consequently, acquisition/processing, public services and statistics/secretariat sub-units were created. Though the services of the sub-units staff were made to overlap. Such arrangement makes it possible for the unit head to assign responsibilities to staff and for other management purposes. The sub-units, headed by professional librarians report to the ICT Librarian who in turn reports to the University Librarian on the day to day running of the unit.

Acquisition/processing sub-unit was responsible for all issues relating to the unit's acquisition of electronic resources, hardware and software. It is responsible for the subscription of electronic resources and also initiates the process for the acquisition of any hardware or software. It also processes the CD or hard disk drive resources for use by registered library users.

Public services sub-unit has responsibility of making available to users all the electronic resources acquired and processed by the Acquisition sub-unit. They are responsible for lending of CD, hardware, provision of user authentication information, OPAC and Internet services

Statistics/Secretariat sub-unit manages correspondences of the ICT Unit. It also keeps statistics of all activities in the unit namely acquisition, processes and use.

The commencement of automation in the Library and use of EndNote software brought about the creation of two additional sub-units namely data entry and editing, and digitalization. Despite the arrangement, staff of the sub-units could be moved to any area of need at any time.

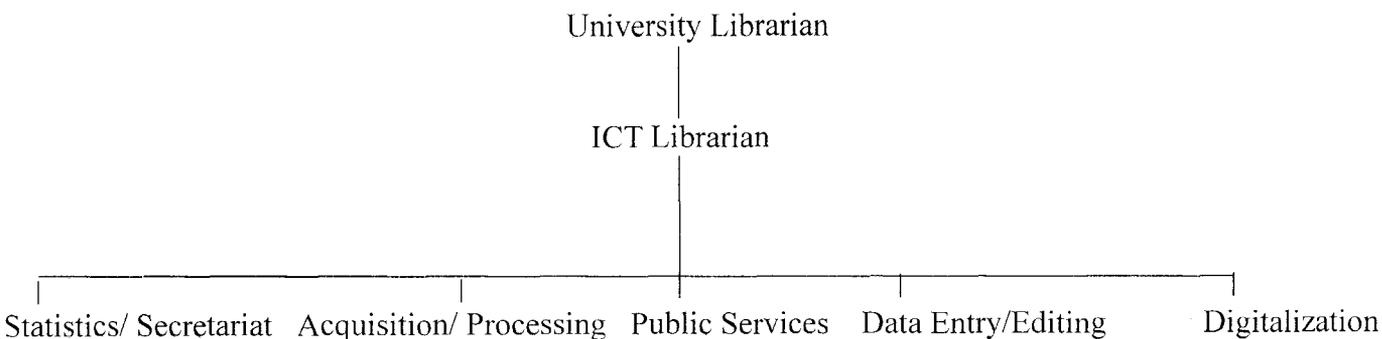


Fig.1. Organizational Structure of FUTO Library ICT Unit

ICT Facilities

The audiovisual facilities of the Library served as the foundation facilities for the Unit. They were overhead projectors, television, radio cassettes, video cassettes and microfilms. On the creation of the Unit, one computer system (Pentium III) was assigned to it. Today the facilities have grown to include a variety of hardware and software, CD-ROM, Databases.

Hardware and Software

By 2001 when the Unit started operation, only one micro computer was available. A boost in the number of computers was recorded with the donation of 10 personal computers by the Open Society Initiative for West African (OSIWA) in 2005. This served as bedrock to the consolidation of ICT operations and services in FUTO library. Presently the Unit has 25 Pentium IV networked personal computers with accessories, One business PC (a donation from Association of African University AAU), 1 server (1GB RAM and 80GB Hard disk), 3 Hp scanners, 1 multimedia projector with screen, 1 digital camera, different capacities of external mass storages devices for backup. The hardware used for Internet connectivity include a 2.4m diameter dish, with 2 Watts BUC transmitter, S2A Linkstar modem, a proxy server as well as 32, 16 and 12 ports switches distributed over the library Local Area Network.

The operations of the Unit is carried out with the general purpose application software – Microsoft office suit ranging from 2000 to 2007 and the operating systems - Windows Me, XP and Server 2003. The acquisition of *Alice for Windows* Library Software in 2006 enabled the automation of the Library. Furthermore the Library was provided with EndNote digitalization software in April 2008 by AAU.

Compact Disk Read Only Memory (CD-ROM) Collection

Through acquisition, donation and subscription, the Library has built a collection of CDROM. The Unit also has a collection of students theses/dissertation submitted on CD. The CD-ROM are processed using an in-house developed classification scheme to reflect the five

schools in the University namely Agriculture (S), Engineering (T), Science (Q), Management (H) and Health (R). The broad class mark of S, T, Q, H and R are used respectively for them. The class 'G' is used for all CD that fall outside the five schools while "Thes" is used to differentiate theses/dissertation from the rest of the CDs. The Unit has been able to process 463 CD ROM on Agriculture, Engineering, Science, Management and Health Technology and 164 Theses/Dissertation which are arranged on CD- racks. Dully registered users consult the CD in the Unit or are given opportunity of over-night loan.

Offline Digital Library and Databases on Hard Disk and CD-ROM

The University library is among the beneficiaries of e-Granary, the Widernet project of the University of Iowa. A 20 GB e-Granary digital library was installed in 2004 with a LAN of 10 workstations. Library users were utilizing the services until 2005 when the disk crashed. Arrangement is on the way to acquire the new 750GB e-Granary Digital library. The library also benefited from the EBSCOhost database on CD-ROM for libraries which could not access the Internet. The 38 CD-ROMs covers academic periodicals, business periodicals and bibliographic references. They are still in use in the ICT Unit despite its connectivity Internet- wise. Also available in the Unit are the Encyclopedia Britannica on CD and demo CD of The Essential Electronic Agricultural Library (TEEAL).

Online Resources

FUTO library is among the first university libraries to subscribe to online portal sponsored by Food and Agriculture Organization, World Health Organization, Cornell university, Yale university etc. These portals include Health Internetwork Access to Research Initiative (HINARI) launched in 2002, Access to Global Online Research in Agriculture (AGORA), launched in 2003 and Online Access to Research in the Environment (OARE) launched in 2006. EBSCOhost and Nigeria Virtual Library are being enjoyed by registered library users of FUTO. Before the installation of Internet in the Library, users were provided with authentication information for use outside the Library.

Automation of the Library Operations

Automation in the Library was among the most challenging aspect of ICT application. The library was faced with the challenge of *need assessment*. The Wright assessment technique was employed and the library Management went into lobbying the University Management, a strategy for the financing of the project.

Furthermore, the University Librarian and the professional staff in the ICT Unit started brain-storming on modalities to achieve automation. Convinced that automation is important for efficient and effective library operation, the ICT Unit staff embarked on opinion sampling, consultation and studying of available software. Exhibitions by software vendors during national conferences also helped the staff to have close interactions with vendors. Alice for Windows, Glass, X-Lib were considered and finally a decision was taken to do a facility tour to University Libraries using Alice for windows.

Having reached a decision to use Alice for Windows, the University acquired 10 Zinox computers, a server (1GB Ram with 40GB hard disk), a scanner, a printer and a Zip Drive For storage, barcode readers and barcodes for resources and users.

In 2005 a local area network was developed to include ICT Unit, Circulation and supposed Catalogue areas as well as University Librarian's office. The Management, Circulation and Inquiry modules of Alice for Windows was acquired on 20th March, 2006. This was followed by installation and training which started on 23rd March 2006. 26 staffers of the Library were trained in 3 areas namely, Systems, Cataloguing and Circulation.

The Library did not waste time to embark on retrospective conversion and input of currently catalogued resources as well as developing electronic database of users. Some staff members who participated in the training were deployed permanently to the ICT Unit to achieve speed. Subject manual catalogue were used for retro-conversion while the clerical staff, library officers, assistants and attendants were employed for data entry. The professional staff were engaged in editing as well as system management in the ICT Unit. The Library opened the Inquiry Module - Online Public Access Catalogue (OPAC) and users were helped to have bibliographic access to the Library resources.

In October 2008, the Serials Module of Alice for Windows was acquired and has been put to use. Presently, the Library has completed the retrospective conversion though in the process of checking to recover lost entries. Due to technical problems encountered in the course of the conversion, certain records were lost, and fresh input was made of all such records. Profile of all the registered users in the Library has been taken in readiness for opening of Circulation module. Two sets of technical supports are available namely software support by the Software vendor and the hardware support provided by Hardware /Network engineer on contract basis.

Digitization of the Library Resources

Initial digitization efforts started with the collation of all electronic theses/ dissertations submitted to the library and storing them on a CD-ROM. This was motivated by the acquisition of the Database of African Thesis and Dissertation (DATAD) CD-ROM, donation by the Association of African Universities (AAU). Though fruitless effort was made to get the Procite software used in producing the DATAD, a window of hope was opened when in Sept 2007 the University Librarian attended policy workshop in Kenya organized by DATAD co-coordinators. The aftermath of the workshop was the invitation for training in Addis Ababa on **EndNote**, a full text enabling software that replaced **Procite**.

In May 2008, Endnote was installed and used to populate all the digitized resources in the Library. Theses/dissertations housed in the EndNote database are searched in the Library as well as sent to AAU. In December 2008, AAU donated to the Library a business PC (Hp Compaq dc 7800p ultra slim, Dual core CPU 2.33GHz, 1.98 GHz RAM etc) and a scanner (Hp Scanjet 7800) to enable the Library commence digitization of other indigenous resources. Presently, a total of 126 theses and dissertations are available for search while 164 print theses dissertations have been digitized.

ICT Services to Users

Taking its step from the spirit of FUTO traditional Library, the essence of ICT adoption is enhancement of services commensurate with best global practices focused on satisfying every class of users in the University. Users are on the move and ready to bypass any library that could not provide desired services. Thus, given the structural, operational and e-resources available in the ICT unit of FUTO, CD-ROM services, offline/online database search, Internet services and

selective dissemination of electronic information are provided for users. The Public Services sub-unit manages all the services in the Unit.

CD-ROM Services

Processing of the CD-ROM in the Library reveals the availability of very rich indispensable e-resources. Many texts in the Library were underutilized before the accompanying CDs were identified, processed and made available. Many rare applications were not identified until the processing of the CDs. Above all, many current qualitative e-text and e-journals available on CD were not used due to unprocessed CD-ROM. The in-house classification of these resources and consequent automation opened a new access mode to users. Users access the bibliographic information of the CD-ROM via the Online Public Access Catalogue(OPAC) and are given opportunity to use them in the ICT Unit or borrow overnight.

Offline/Online Database Services

The entire databases subscribed by FUTO library are made available to users as offline or online resources. Offline database like Ebscohost on CD, and OASIS database of Alice for windows are provided for users to search through the CD and OPAC respectively. Assistances are provided to users where necessary. Authentication information for OARE, EBSCOhost, HINARI, AGORA etc are provided to users with which they access them via Internet centres including that of the Library. Sample copies of Journals contained in the databases are also downloaded to aid the Library during accreditation exercise

Internet Services

The foundation of Internet services in the Library was laid by the donation of 10 computers, VSAT and 64/128kpbs bandwidth to the library in 2005 by the Open Society Initiative for West Africa (OSIWA). The University continued to support the Internet when OSIWA withdrew its support. Presently, Internet services are provided in the Library using 25 computers running on a C- Band 64/256kpbs. Library users are charged minimally for printing to recover cost.

Current Awareness /Selective Dissemination of Information

Migrating from the traditional to the ICT driven services makes lots of demand for patience and understanding from both the service providers and the users. Users are not only ignorant of the usefulness of the services but also resist them. Lists are made of newly acquired CD-ROMs and other databases and put on bill boards, and the University newsletter. They are also sent to faculties for perusal. Faculties are informed of new e-resources through Library representative in School Board Meetings. New students are informed through their orientation exercises.

Training of Library Personnel

The success of ICT adoption in the Library is hinged on training of both staff and users. The Library management did not hide its intention in making giant strides in the 21st century services. From the onset, staff members are given opportunity to attend every ICT based training within and outside the country. The Library is always represented in the Nigeria Library Association

NLA) conferences. Acquired skills are adopted in the various library's ICT operations and services.

Mentoring is considered a very important avenue for ICT skill acquisition and transfer. More knowledgeable staffs support others. Training by the Automation Software vendor was provided for 90% of library staff from which the best were selected for automating the Library. Apart from the later, regular trainings are organized to enable staff improve on their skills.

Training of users has also received considerable attention. E-resources users are provided with on the spot personalized training. A University-wide training was organized by the Library in collaboration with Centre for Agricultural Research FUTO, in January 2009 on "Accessing the online resources subscribed to by the Library". Over 500 staff members participated.

Challenges of ICT Adoption

The challenges of ICT adoption in FUTO Library are enormous, ranging from personnel and users through technology to the general environment of the Traditional library.

Personnel-wise, ICT use for Library operations and services requires library practitioner who are not only skilled in traditional library operations with a high level of computer literacy, but also committed and flexible librarians, who are ever ready to engage in sustained reasoning and can manage complex situations. The readiness of an individual staff to take risk and drive others to work was identified as very essential in ICT application. Identifying such staff was the problem faced by the Library management which later succeeded in selecting 25 of the 108 staff to drive the ICT adoption. Many other library staff who were not computer literate were encouraged to gain that later.

Low level of awareness of the availability of ICT and the opportunities ICT use in library could offer reduced the initial CD-ROM services patronage and some other online resources which the university library subscribed to. Library management used the University and Library billboards, newsletter and the Faculty/School boards to disseminate information on the ICT-driven library operations and services.

The use and handling of CD – ROM by users presented another difficulty. Different CD-ROM required different mode of installation and access to content. Most of the CD-ROM were destroyed by users in the course of use. Also the mode of processing and storage of CD-ROM was another challenge as standards must be compromised. This made the library to adopt an in-house mode of processing.

Use of OPAC was another difficulty for users hence staff was assigned to help in an event of such difficulty. The choice of hardware and software technologies was another challenge. Most technology vendors were making attractive offers. Thus there was the problem of identifying the most appropriate for the Library setting. Therefore, consultations and visits were made to university libraries that have adopted ICT in library operations.

There was the problem of interfacing of hardware to prevent virus attack of the automation databases. The Proxy server was installed with firewall and access to the automation database was restricted.

Inadequate backup of entries and loss of data was experienced severally during the course of automation. External backup was made with Zip drives though much success was not made because the zip drives also failed sometimes. However, the adoption of external hard disks for backup helped to solve the problem of data loss.

The downtime of internet not only discouraged users but reduces the effectiveness and efficiency of library operations and services.

The initial environmental challenges were erratic power supply and the inadequacy of the UPS to support the systems especially the *servers* and the *modem*. These brought about break down of equipment, and system errors. Solution was provided by the acquisition of a generator for the Library.

Restructuring and modifying of the library environment to accommodate the electrical and data cabling brought about serious reorganization of resources, reading tables and chairs.

There were the challenges of how to approach the retrospective conversion of approximately 70, 000 catalogue entries in the library. It was finally decided that typists in the library be used in place of data entry contractors/vendors. Retrospective data entry revealed some problems which include;

- (a) Errors in cataloguing and classification;
- (b) Errors in catalogue card production;
- (c) Missing catalogue entries;
- (d) Duplicate entries;
- (e) One accession number assigned to more than one resources (Duplicating of Accession numbers);
- (f) Entry for lost or missing resources have no indication concerning their status;
- (g) Wrong entry due to poor knowledge of library operation by data entry clerks;
- (h) Use of 20 to represent the year 2000 instead of 00 during accessioning.

Some of these problems were solved by retrieving the physical resources from the shelves ; fresh data entry to ensure recovery of lost data; editing of entry made by data entry clerks by professional librarians; providing card catalogues entry to replace lost cards. The later is necessary since the library uses hybrid catalogue (Card and Online Public Access Catalogues) or parallel automation implementation.

Conclusion

It is yet morning in adoption of ICT in library operation and services and FUTO Library is poised to face these technological challenges. Big things starts small and having handled the challenges of CD-ROM services to automation and Internet services and having started the digitization of indigenous resources, only the technology which drives digital library is needed to provide web 2.0 operations and services.

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