

AFRICAN JOURNAL OF LIBRARY, ARCHIVES AND INFORMATION SCIENCE

VOLUME 13 NUMBER 1 APRIL 2003

Page

Tom Adami The Management of International Criminal Justice Records: The Case of Rwandan Tribunal.....	1
Margaret Adeogun The Digital Divide and University Education Systems in Sub-Saharan Africa	11
Flatiel Fabio Villanculos and Kgomotso H. Moahi Assessment of the Use of Information and Communication Technologies (ICTs) in the Financial Sector: A Case Study of the Mozambican Banking Sector.....	21
Y. A. Adedigba and E. O. Ezomo The Management of Systems Migration in an African Setting.....	35
Ayoku A. Ojedokun and Emmanuel O. Owolabi Internet Access Competence and the Use of Internet for Teaching and Research Activities By University of Botswana Academic Staff	43
Rose B. Okiy A Comparative Analysis of the Characteristics of Authors in Four Nigerian Librarianship Journals	55
O. O. Adelowo and R. O. Agbonlahor Challenges of Developing a Taxonomic Information System (TAXIS) on Indigenous Medicinal Plants of South Western- Nigeria.....	65
Short Communication Impact of Intervention Measures on Collection Development at Abubakar Tafawa Balewa University Library, Bauchi.....	79
Book Review Into the Information Age: Computerisation of the Copperbelt University Library.....	87

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

The Management of International Criminal Justice Records: The Case of Rwandan Tribunal

Tom A. Adami

Criminal Tribunal for Rwanda
Arusha International Conference
P. O. Box 6016
Arusha, Tanzania
E-mail: Adami@un.org

Abstract

The International Criminal Tribunal for Rwanda (ICTR) has been widely criticised for the slow pace of justice and for mismanagement. On the contrary, much has been achieved in an African context to assist in achieving peace and reconciliation for the people of Rwanda. The information management programme of the ICTR has developed some unique and innovative ways of dealing with its large and varied collection of judicial records. There is much to be proud of in the achievements of the Records and Archives Unit of ICTR. This paper aims to share with others the experience of ICTR in the management of large and varied judicial records.

Introduction

The International Criminal Tribunal for Rwanda (ICTR) was established in an attempt to bring to justice the main perpetrators of the Rwandan genocide in 1994. Because of this desire for justice an adhoc organisation was established in Arusha, Tanzania to place on trial those accused of atrocities. Given that there are very few examples of international courts that deal with individuals in a criminal justice capacity, the ICTR had to develop its policies and procedures largely as it went along. This is the first of two articles on the records of international criminal justice organisations. This first article will deal with the records of the ICTR. If one takes time for a moment to look back at where the current basis for international criminal justice record keeping has come from, then one sees a relatively short history of events going back just to 1945.

The second article in a future issue of AJLAIS will document how the ICTR relates to other developments in the field and what lessons there are for Africa to learn from this.

The Process and Concept of International Criminal Justice

The United Nations Convention on the Prevention and Punishment of the Crime of Genocide adopted in December 1948 states in Article 1: that The contracting parties confirm that genocide, whether committed in time of peace or in time of war, is a crime under international law which they undertake to prevent and to punish. It is upon this basis that the current international courts are established. The soon to be established permanent International Criminal Court (ICC) will also have as one of its founding principles this UN Convention. According to Boutros-Boutros Ghali, when he spoke of the events in Rwanda in 1994, "We are all to be held accountable for this failure, all of us, the great powers, African countries, the NGOs, the international community. It is genocide... I have failed... It is a scandal". (Ghali, 1994). Sentiments such as these galvanised the opinion of the international community at the time to do something to prevent this from happening again.

So it is that crimes such as extermination, attempted or otherwise, crimes against humanity, which includes the crime of rape, acts of mass atrocities, complicity to commit genocide and also incitement to commit genocide are all punishable in the context of international criminal justice. The records of any organisation dealing with such crimes will be directly related to a specific judicial process. This judicial process, which is still forming, is complex and can be an extremely long one. The records of these proceedings are usually compound records in various formats and on different media. Dispersion of records can easily occur due to the many distinct phases in the process of their creation. The initial trial phase records might be deposited in archives when a review is called for and another phase in the judicial process is begun. These linkages and relationships need to be established and maintained over time. This is the unique aspect of the records of international courts dealing with genocide and other crimes against humanity.

Historical Perspective

Laws are generally passed in a framework of current societal and political constructs that demand standards of behaviour of members of any given community. Justice is dispensed within this framework to reflect the overall standards of accepted behaviour. The Salem Witch Trials of the late 1600s show us clearly that the basis upon which many people were killed was flawed and unacceptable today. Perhaps our current basis for law making and judicial systems will also one day be seen as flawed. The following historical examples are meant to set the scene for discussion of present-day systems.

The records of the trial proceedings, any appeal and the judgments and decisions should naturally form the basis of the case files. Records of transfer and detention should also form a part of the case file. This is particularly important if the case was ever to be re-heard or re-opened in a future court hearing. If the person was pardoned

or released early, all these records should form part of the case file. In the case of Nuremberg, at least, it was not seen as one ongoing case from indictment and arrest to eventual release or death in detention. This is the crux of the matter with regard to the case files of international criminal justice. The 'case file' is an amalgam of various and varied formats and media. The judicial records of the ICTR comprise the first instance trial stage (public and under seal documents), any appeal on merits and interlocutory appeals, the audio-visual records (audiotape, CD-ROM with digital sound files and videotape recordings of trial proceedings and witness testimony), the exhibits, the transcripts of hearing, and records of transfer for detention. The case file records should continue to include the records of administration of the sentence, and any subsequent release or re-opening of the case. It should also include the witness records which are not currently part of the case files, defence lawyers records (administrative and judicial) and also the records of the Presidents' and Registrars' offices. Only in this manner can an overall picture be drawn of the administration of justice within the organisation.

The challenge is to bring together at times these incongruous elements into one homogenous whole. Researchers to this day find it difficult to consult both the Nuremberg and Tokyo records. It is hoped that the trial records of both the ICTR and The International Criminal Tribunal for Yugoslavia (ICTY) with all its components will be accessible at one location using one system of intellectual control. This should be the emphasis of archival custody of these records and, hence the crux of archival access policy, once the two *ad hoc* tribunals have completed their mandated work.

International Criminal Court Developments and Application of ISO 15489

As at 2002 there were 139 signatories and 83 ratifications of the Rome Statute on the establishment of the ICC (Dieng, 2001). The ICC will not be a full UN body. It will be associated with the UN and use its staffing rules and regulations but will basically be an independent organisation associated with the UN. It will be funded by states that have ratified the treaty.

The ICC's success depends on its capacity to execute, from entry into force; those functions entrusted to it as a global public service ... From the moment of entry into force, the Court will receive information, and will be obliged to acknowledge receipt, classify and archive such information ... The Office of the Prosecutor will need its evidence unit in place, and systems to ensure the chain of custody of evidence. Thus, if the ICC is to operate, even in just these preliminary areas, basic systems such as security plans, staff rules, DSA scales, procurement rules, computer systems, archiving systems, etc. will need to be in place. These need not be the same as those used by the *ad hoc* Tribunals, but, as the ICC carves its own path, taking note of our technical

experiences in these areas may help it identify what will fit best (Dieng, 2001).

The UN, like all other organisations, will hopefully see the value in the application of ISO 15489 records management. UNESCO has taken the lead with several initiatives on record keeping and archives management. Hopefully they will also do the same with ISO 15489 in the UN framework. Any record keeping programme at the ICC should ideally take into account this standard.

Current Organisational Structure at ICTR

What currently operates at the ICTR is a hybrid system of many components of national work practices and heavily African-influenced physical records centre and archives. Most of the para-professionals are from East Africa. The Judicial Records and Archives Unit (JRAU) was established as a records centre and archival unit in late 1998. This was the first step in continual refinement of the work of the JRAU which has resulted in a system that is aimed totally at serving the requirements of the judicial process. Prior to 1998, the current three courtroom assistant staff were responsible for all information management aspects of the cases before the Tribunal. This was clearly an unworkable arrangement as has been shown by the corrective action taken in terms of case file arrangement, folio numbering and handling of joinder cases. March 2000 saw the re-engineering of work practices in the Unit at the behest of the then Registrar, Dr. Okali.

The JRAU is part of the Court Management Section (CMS) of the Judicial and Legal Services Division of the Registry. The Unit has 17 staff, defined in 3 sub-units. These staff are distributed in the different sub-units as follows: active records management (12), audio-visual and exhibits (2) and electronic record keeping systems (2). Oddly there is no archival sub-unit and given the prominence of the word 'archives' in the Unit name one may indeed question this aspect of the staffing structure. In the near future the staffing level will stand at 21 as follows: active records management (14), audio-visual and exhibits (3) and electronic record keeping systems (3).

The information management practices of the ICTY are, like the ICTR, the result of an isolated development process. It was not until recently, when the two registrars of the ad hoc tribunals issued a statement on enhanced co-operation between the two judicial organisations. The structure at ICTR is a result of the unique requirements of the Rwandan Tribunal. The former Registrar initiated a review of the operations of CMS in March 2000 and this has been one of the many changes in the approach to the work of the Unit. The result was that the work of the records and archives unit was enhanced.

It is difficult to draw analogies between the two adhoc tribunals as both are the product of up to nine years of relatively isolated development in very different physical locations, with different staff and working with different senior management guided objectives. There was one situation where United Nations Archives and Records Management Section (UN ARMS) was to conduct an investigative mission to Arusha and guide the overall development process of the record keeping culture of the Tribunal to align it more with UN HQ Archives practices. Another mission then followed in 2000 and several visits by the TRIM LAN Administrator from UN HQ to assist with the conversion, migration and implementation of the operational TRIM record keeping database (Sisk, 2001). Tower Records and Information Management (TRIM) is a proprietary acronym for the record keeping software developed by the Australian company Tower Software.

Given the current work directions and the close interaction between ICTR and UN HQ ARMS staff, ICTR is well placed to pass on to future generations a fully accessible and complete record of what transpired at the ICTR from 1995 to around 2008, the likely date of completion.

Record Keeping and Information Management Practices at ICTR

Moves towards implementing a digital record keeping and archival system were started as a result of the 1998 report by Bridget Sisk from UN ARMS. In that report it was recommended that, among other things, policies and procedures could be standardised to a certain extent and as far as practical to those of UN HQ and Secretariat practices. The implementation of the TRIM record keeping system was suggested, as was the formalisation of the staffing structure which is evident today. As a result of much concerted effort, the ICTR records management and archives staff have developed a judicial keyword thesaurus, a working electronic record keeping system (TRIM) with a public access module via the Internet, and a record keeping metadata standard. Work continues on other aspects of ICTR's work such as developing guidelines for handling the ever growing audio-visual and exhibit collection, expanding the mandate to include a vital records programme, a retention schedule and access regime for archival records once transferred to the Headquarters Archives.

Much still needs to be done but as with any active records and archival centre, circumstances and requirements are gradually changing for many reasons. In the case of the ICTR it regularly adapts work practices due to human and financial resource constraints. The ICTR likes to provide everything the clients want, but it also has to provide a service that is feasible and not what is wanted.

The details of the list of record keeping policy documents that relate to record keeping metadata, disposal schedule of the ICTR records and the electronic record

keeping framework diagram of the TRIM architecture and hardware can be found on the ICTR's website <http://www.ictr.org>.

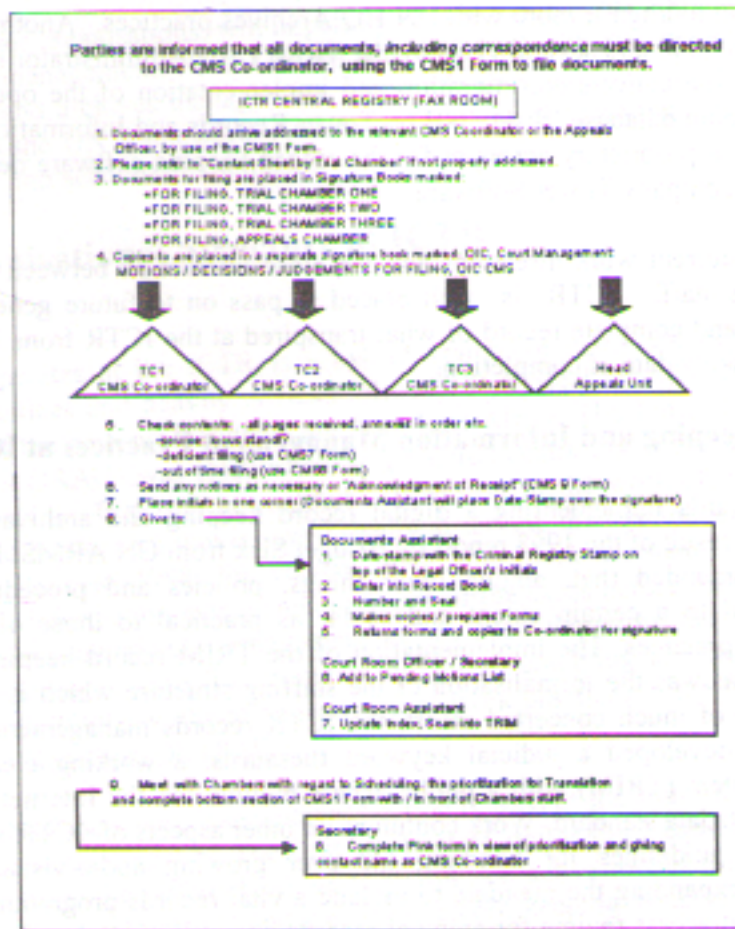


Figure 1 – ICTR Physical Paper Judicial Documents Flowchart

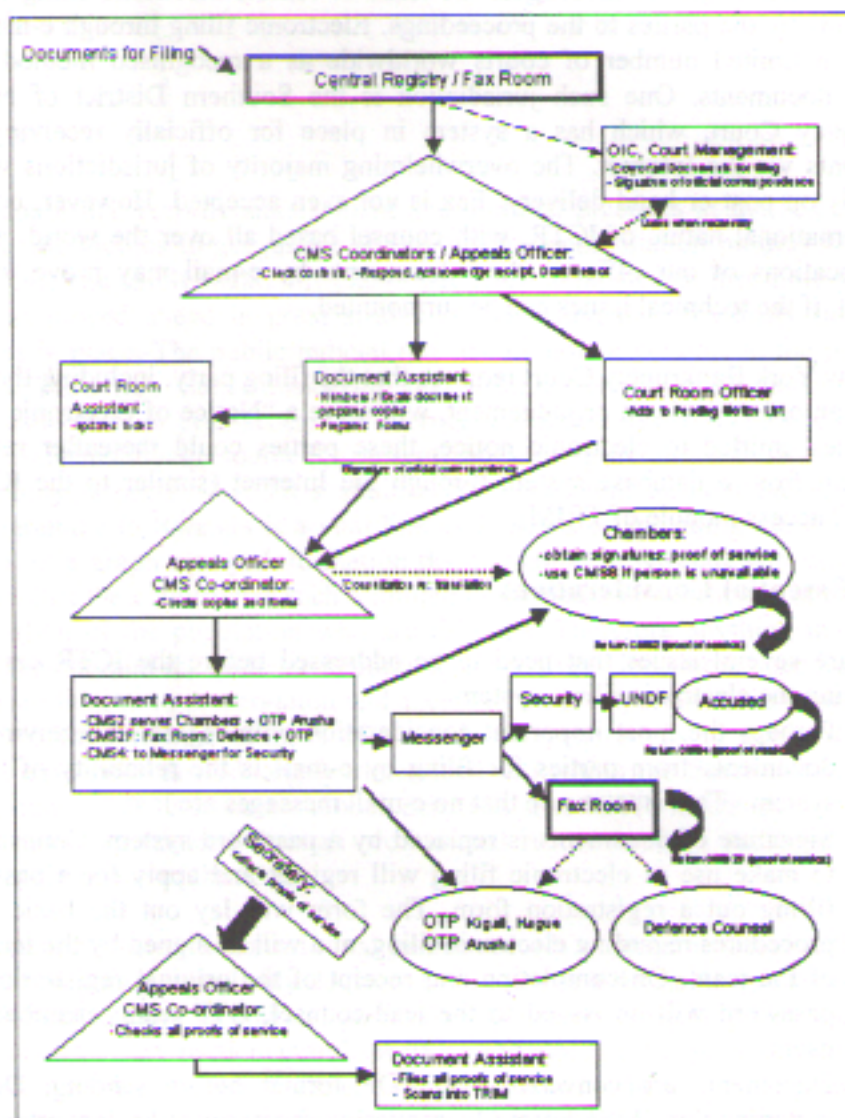


Figure 2 – ICTR Physical Paper Document Filing Procedure

Electronic Filing Project

The ICTR has begun to investigate the issue of remote electronic filing of judicial documents by the parties to the proceedings. Electronic filing through e-mail is only used in a limited number of courts worldwide as a recognised method of filing judicial documents. One such jurisdiction is the Southern District of New York Bankruptcy Court, which has a system in place for officially receiving judicial documents via the Internet. The overwhelming majority of jurisdictions worldwide rely only on post or hand delivery. Fax is not even accepted. However, considering the international nature of ICTR, with counsel based all over the world, as well as three locations of our offices, filing documents by e-mail may prove to be very efficient, if the technical issues can be surmounted.

The New York Bankruptcy Court requires that the filing party, including the chamber issuing an order, decision or judgement, will serve a "Notice of Electronic Filing" to all parties entitled to electronic notice, these parties could thereafter retrieve the document from a database system through the Internet (similar to the ICTR's "e-Drawer" access module of TRIM).

Some Essential Considerations

There are several issues that need to be addressed before the ICTR can consider implanting the electronic filing system.

- Perhaps the most important consideration with regard to receiving judicial documents from parties for filing by e-mail is the reliability of the e-mail system. This is to ensure that no e-mail messages are lost.
- Signature of documents is replaced by a password system. Counsel wishing to make use of electronic filing will register and apply for a password, by filling out a registration form. The form will lay out the basic rules and procedures regarding electronic filing, and will be signed by the lead-counsel of the team. On completion and receipt of the original registration form, a password will be issued to the lead-counsel, OTP team, chamber or other users.
- Documents are converted into PDF format before sending. Documents, including the CMS1 Form (Transmission sheet), must be converted into PDF or TIF format before being sent to the Registry. This will ensure that any interested party cannot modify the documents sent at any stage.
- Documents are sent straight into TRIM through the password accessible area of our website. The Bankruptcy Court has an advanced system, through which the filing party accesses their website. After entering a password, the user enters a special area of the site in which the user may select an option to file a document electronically. Thus the person filing the document completes the data-entry normally undertaken by document assistants entering documents in TRIM. On submitting the document, the party sends it straight

into TRIM (through e-Drawer). Furthermore, the action of submitting the document triggers an e-mail to be sent to the party who receives a "Notice of Electronic Filing". The other parties could then retrieve the document from TRIM.

Conclusion

There is no doubt that records management and archival practices at the ICTR are assisting genocide victims to get justice and to aid the reconciliation process within that country. One can safely make this claim because, compared to just three years ago, ICTR has moved ahead in great strides in expanding the previously limited access regimes in place. The public judicial records are now accessible to the public through the ICTR's web site. Considering that a large number of Rwandans are illiterate and cannot use or even access the Internet, the access system is now in place to provide the informational resource for present and future generations of Rwandans. More importantly, aspects of ICTR's audio-visual collection, through the ICTR's Outreach Programme in Rwanda is a vital link as a means of spreading the word of ICTR's work in a graphic way. Information dissemination in Rwanda is a difficult prospect given that the country has such a limited mass media infrastructure and such a large proportion of the population who are illiterate. Therefore anything that the Tribunal, in general, and the Judicial Records and Archives Unit, more specifically, can do to ensure long-term preservation and access to these important documents is a positive step forward for the citizens of Rwanda for generations to come. These achievements have been carried largely unheralded and within the framework of the records continuum. The continuum model demands that ICTR meets current and future community expectations through professional record keeping and also meet operational requirements of the ICTR.

The development of international criminal justice records management and archival practice is still on-going. It probably does not even exist as a definable sub-set of the larger records management or archival profession. Is it even something that one can highlight as having a very particular and specific methodological approach compared to medical, scientific or even general legal records management practice? International criminal justice record keeping practice will have certain dimensions of its work which will be unique. To this end one can point to certain individual and isolated developments from the past decade or so. These include the nature of the records themselves, records of protected witnesses, rules on evidential qualities of records in an international framework, exhibits of horrific and graphic events (both physical and audio-visual), and the post-sentence administrative records of the accused persons who may be sent to a third country to serve their sentences. The accused persons may remain in detention for the rest of their lives, which may be up to 40 years or more. The separation of what theoretically is the one distinct file into many constituent parts poses a potential dilemma. The maintenance and possible

reconstitution of the compound records into one homogenous 'case file' should be a goal of any record keeper.

References

- Dieng, Adama (2001) Address by the Registrar of the ICTR to the Preparatory Commission for the ICC during its Eighth Session, New York, Monday 1 October, 2001. <http://www.ictr.org/ENGLISH/speeches/index.htm>
- Ghali (2001) United Nations Secretary General Boutros-Boutros Ghali at <http://www.rudyfoto.com/RwandaQuotes.html>
- Sisk, Bridget (2001) Report on Mission to ICTR by UN Archives and Records Management Section [UNARMS], November 1998. Follow-up Report in March 2001 by Bridget Sisk and Visits by UN ARMS TRIM LAN Administrator, Don Sugiarto, in October 1999 and March 2001.

* Tom A. Adami is the Chief Archivist, Judicial Records and Archives Unit, CMS International Criminal Tribunal for Rwanda, Arusha Tanzania. He attended Wollongong University, New South Wales, Australia and Monash University in Victoria, Australia. He holds BA, MA (History and Politics) and a Certificate of Award in Modern Record Keeping and Theory.

The views expressed herein are those of the author and do not reflect the official opinion, expressed or implied, of the International Criminal Tribunal for Rwanda.



TOM A. ADAMI

The Digital Divide and University Education Systems in Sub-Saharan Africa

Margaret Adeogun

Baraton Library

University of Eastern Africa

P.O. Box 2500

Eldoret, Kenya

E-mail: adeogunj2000@yahoo.com

Abstract

This paper examines the concept of the digital divide, how the divide can relegate Africa to the background and how a transformed tertiary educational system can help to minimise the bridge between the information-rich countries of the North and the information-poor African countries. It is argued that if the barriers to accessing and synthesising information can be removed, African scholars and researchers can contribute significantly to global knowledge development. They can also adapt existing knowledge to enhance sustainable development in the African continent.

Introduction

The convergence of computer technology and telecommunications has resulted in information and communications technologies (ICTs) as exemplified by a growing number of electronic communication and retrieval systems. Activities that were deemed impossible in the past or those that were hampered by time and distance are now being performed with ease. New activities have emerged and new ways of doing old things more effectively and cheaply have come to light. The ability to network computers in different locations has eased the transfer and retrieval of information. This new development has led to an exponential growth in knowledge that is readily identified, located and accessed through global electronic networks such as the Internet and the World Wide Web. The Internet ensures that sources of knowledge are easily identified, located and readily accessed at a reasonably cheap cost. Those who have the skills and the necessary infrastructural devices to access information through it are continuously accessing extraordinarily esteemed resources at a much greater depth and quantity than ever before. This knowledge explosion is having a tremendous impact in the transformation of economic and social order. It has transformed the world from a manufacturing-centred economy into a knowledge-centred economy (World Bank, 2000). In the industrial age, economic advancement

was achieved through the application of technology and cheap labour to produce goods. In the present information age, however, economic advancement is achieved by applying systematic knowledge to improve social and economic activities. The new direction to technological and economic development is no longer in extensive manual labour, but in knowledge building and the application of systematic information in the design and production of goods and services (World Bank, 2000). Thus, employers now require workers who are capable of applying the enabling capacity of ICT to solve business problems, design new products, and improve services to clients.

The Knowledge Revolution and University Education

The demands of the knowledge economy have revolutionised the education sector, and formal education systems have become more versatile and flexible. Hargreaves (1997) describes education systems now as more "porous and permeable". In the traditional education system, learning takes place mainly in the confines of the four walls of a classroom. The new world order characterised by abundance and ready availability of digital information through computer networks means that information has become ubiquitous, and therefore, can be obtained at any time, and in any location no matter the distance as long as the necessary infrastructural devices and the skills to retrieve information from global information networks are available. ICT therefore has broken the barriers of time, distance and location, barriers that have impeded the growth of formal education. Today, distance learning, virtual, and collaborative academic activities are taking place across geographical regions. ICT has enabled tertiary education to break the chains of confinement. No wonder Millar (2000), citing James Wolfensohn, President of The World Bank, declares that, "knowledge had become the most important factor in the capacity building of individuals and society". Knowledge therefore becomes the single denominator for social, economic, and educational advancement, bringing to birth a new world order called the "knowledge revolution". This revolution is the primary determinant of the quality of human life. Alvin Toffler appropriately emphasises this in his *POWERSHIFT* quotation cited by Talab (1992) "Knowledge has gone from being an adjunct of money, power and music power to being their very essence. It is in fact, their ultimate amplifier. This is the key to the power shift that lies ahead and it explains why the battle for control of knowledge and the means of communicating it is heating up all over the world". The present breakthrough in information transfer and its resultant globalisation reinforces the power of information in transforming the world and in determining the kind of world order that exists. It also justifies and intensifies the unique role the library plays in a university setting.

As mentioned earlier, sustainable development has become increasingly knowledge-driven and information has assumed strategic importance in both social and economic development. Social and economic transactions are enhanced by information communications technology which transcends space and time. In the midst of this

major technological revolution, Castells (1993) asserts that it has become increasingly impossible for any society to innovate entirely by itself without transferring knowledge from other parts of the world and adapting it to the local situation. And in Africa, being a developing continent, there is a continuing need to adapt discoveries made elsewhere to the local environment. Davenport (2000) claims that this creates a demand for high-skilled labour force educated in a context of research. Castells (1993) maintains that it requires human resources to be able to adapt their skills continuously to the fast pace of technological change and be able to contextualise research findings of other places to local situations and also be part of the global scientific networks. The new work force must be capable of locating, accessing, analysing, and synthesising information to generate new knowledge and products. This new demand justifies Castells's (1993) argument that the basic raw material for economic advancement is not raw farm produce but the human brain and the capacity of that brain to interact with global intellect for the purpose of innovation and the improvement of human living standards.

In the light of the need to apply scientific discoveries to meet societal needs and the new demands of the work place, African universities are increasingly called upon to play a more involving role as engines of scientific and technological development of their societies. In Sub-Saharan Africa, there is a continuing need to adapt discoveries made in other places to local needs because innovations emanating from the continent do not sufficiently meet the demands of the society. Therefore, the universities have to produce more graduates who can create and adapt knowledge to new situations. This is in addition to their traditional role of producing human resources and creating an informed society. The World Bank (1997) claims that the university sector in Sub-Saharan Africa, by its ecology, has the highest concentration of skilled human resources compared to the rest of society. Besides, the training infrastructure outside the university system is weak and poorly developed. Swartz (2000) contends that in such a situation the society relies heavily on the universities to provide, operate and adapt imported technology both in terms of specific skills and in terms of general learning ability to promote development.

Universities are also challenged to establish linkages and partnerships with other knowledge-producing organisations for knowledge enhancement and further discoveries. This challenge to the university system calls for an educational environment with increased access to information resources. Instead of a textbook-driven curriculum, a resource-driven one needs to be put in place. Kachel (1993) is convinced that this approach will help students to engage in independent mental exercise as they apply systematic knowledge to discovery and improve the performance of day-to-day activities through new innovations. The result is continuing sustainable development which will improve human capital and economy. Educators in Sub-Saharan Africa, in the present world order, need to understand that the society has become highly technical and the work place is high-tech; therefore all stakeholders in education, whether private or public, must produce graduates with

relevant skills, as well as the skills to relate in the age of globalisation. It is evidently clear that print information resources alone will not meet the educational demands of the new information economy. Mehta (2000) declares that access to wider, richer resources through cooperation with other institutions and pooling resources together become fundamental if universities in Sub-Saharan Africa are to be instruments of socio-economic transformations driven by science and technology. Students, researchers and teachers should have unhindered access to global networks of information. In this regard, tertiary education systems in Sub-Saharan Africa are in trouble. There is not only gross inadequacy of resources, but access to resources outside the university library is also minimal.

The Digital Divide

Institutions in the developed nations of Europe and North America have not much problems meeting the information needs of their students in the new information economy due to their advantageous location in economically well-endowed regions of the world. Educational information sources such as books, periodicals, CD-ROMs, telephone and the Internet are in abundance. Many educational institutions in Sub-Saharan Africa on the other hand do not have the economic and technological capacities and personnel to provide adequate access to both print and electronic resources that can support the demands of the present education environment. This information gulf that exists between the developed countries and developing countries of the world, particularly Sub-Saharan Africa, according to Larson (2000), can be described as the international digital divide. There has always been an information gap between the countries of the North and Sub-Saharan Africa; however, the present divide in the age of information is far more tremendous. Many African communities have very minimal capabilities to effectively and efficiently apply information communications technologies (ICTs) to accelerate their social, economic and technological advancement and, therefore, are unable to adequately utilise ICTs for enhanced sustainable development.

According to the statistics of the telecommunication infrastructure, UNDP (2000) reported that Sub-Saharan Africa had an average of 14 main telephone lines, 0.5 public telephones and 0.27 Internet host per 1000 people compared to the OECD (Organization for Economic Community Development) countries' average of 490 main telephone lines, 4.7 public telephones and 37.86 Internet hosts per 1000. The low telecommunications infrastructure and few tele-services clearly illustrate the reasons why there is a wide information gap between Sub-Saharan Africa and the West. According to UNECA (United Nations Economic Commission for Africa), there is an average of three million Internet users in Sub-Saharan Africa, out of which two thirds are in South Africa. The ratio then comes to one Internet user for every 750 people outside South Africa, compared to a world average of one in every 35 people, and in North America and Europe, one in three. The gap between the information-rich nations and the information-poor African countries is very glaring.

Many writers have enumerated reasons why an information gap exists in many African countries/academic institutions. Though this paper does not intend to discuss them, some of them are enumerated: poor and inadequate telecommunications infrastructures as indicated by the statistics above; poor national information policy, ineffective planning, poverty, and lack of expertise. Lack of personnel with advanced technological and scientific skills has given the developed countries a monopoly of the information content of the Internet. According to the statistics on Internet content by the Africa Virtual University, Africa has only 0.022% of all the sites on the World Wide Web. This inability to develop and make available sufficient local content on the Internet further incapacitates students and researchers from exploiting the potential of the global information networks. The cost of Internet access is prohibitive to most African universities. Annual Internet subscription cost is high. The generally high telephone tariff is aggravated by slow Internet connectivity. These are some of the factors that have relegated educational institutions in Sub-Saharan Africa behind in their attempt to provide access to global information networks.

There is another kind of divide that is peculiar to Sub-Saharan Africa, and that should be of more concern to African educators. This is the intra-country divide. In most African countries, social and technological amenities are concentrated in the capital cities. It is in these cities that are found the highest concentration of, and the best quality of telecommunications infrastructures, computers, television sets, transportation and mailing services and other socio-economic amenities. The provision and quality of such services diminish as one moves further from the capital cities. Consequently, the cities are the centres of educational and economic activities. This situation has created social and economic divide between rural and urban areas. When foreign business entrepreneurs and non-governmental organisations with business interests in Africa attempt to bridge the international divide in order to promote their business interest, they do so by improving the telecommunications infrastructure in the capital cities for those are the places their businesses are concentrated. This further widens the divide between the cities and the rural areas. The result is that educational institutions located around the capital cities enjoy better telecommunications infrastructure and services. The standard of Internet connectivity is better and telephone tariff is cheaper. There is a proliferation of Internet service provider services in the cities. Thus, students can access online information resources not only in their campuses but also in the several tele-centres in the cities. Other educational institutions which provide similar services can be readily visited.

In the urban cities, the process of acquiring information resources for libraries is readily facilitated: banking transactions are faster and more efficient, resources freighted by publishers and jobbers from overseas have a higher turnaround time than resources destined for the countryside. Correspondences about important library offers are received faster in the cities. The cost of mailing and postage for information resources is greatly reduced. Resource sharing services which are

seriously undermined by distance and transportation are better enhanced where a concentration of institutions with similar interests are within reach. So also are other academic and professional linkages. Academic institutions located far from the capital cities do not benefit from the advantages enumerated above. By virtue of their countryside location, these institutions not only suffer from the international divide but more from the intra-country divide. Consequently, information accessibility both in electronic and the print formats are hampered by poor access to global information networks and poor transportation systems. Information communication technologies as vehicles for extension education and distance learning, which are capable of spreading education to the growing population with ease are hampered by the divide. Many educational institutions in Sub-Saharan Africa cannot effectively use information technology for education advancement and, consequently, are handicapped in pivoting scientific research and its applications.

Reducing the Digital Divide

If universities are to succeed in their role as the engine of development in the new world economy, there is need to devise more effective ways through which the information gap that exists between tertiary institutions in Sub-Saharan Africa and global information networks can be minimised. This calls for an effective information resource management and the forging of partnerships between the well-endowed academic institutions of the North and the less-endowed institutions in Sub-Saharan Africa through the sharing of information resources. This move will achieve tremendous result and open up the global information highway to Sub-Saharan African universities and other higher institutions to share, contribute and use global knowledge for sustainable development.

Information Resource Management Partnerships and Initiatives

There is a need for universities in Africa to benefit from partnerships and initiatives that are helping to bridge the information gap. Such initiatives include the Leland Initiative which aims at extending full Internet connectivity to more than 20 countries. Another remarkable initiative is PERI (Programme for Enhancement of Research Information). Its main objective is to facilitate the acquisition of research materials by students and researchers in developing countries through electronic information and communication technologies. Many scholars who have not been able to access research materials are presently doing so through INASP's (The International Network for the Availability of Scientific Publications) PERI programme.

Resource-Sharing Programmes

Libraries need to establish effective resource-sharing schemes. Considering the present proliferation of information, high costs of information resources, and

dwindling library budget, it is difficult if not impossible for any library to provide all the information needs of its clients. Sharing of available resources will assist in meeting users information needs. Even academic institutions in the developed world have realised that no amount of money allocated as budget can meet the information needs of their students and researchers. With regard to consortia in Africa, apart from the South African Interlending Scheme (SAIS), which established the South African Joint Catalogue (SAcat) there is hardly any nation in Sub-Saharan Africa with an effective well-organised union catalogue that can enhance effective resource-sharing schemes. Liaising with global information networks outside the continent for the purpose of knowledge acceleration can only be achieved when there are successful domestic resource sharing programmes. The availability of a full Internet access and facsimile machine in each library will facilitate online access to the world of information and also the sharing of information resources.

Role of Libraries

The emerging role of the librarian as an information professional in the new knowledge dispensation is enhanced by two main challenges. First, the value of information lies in the ability to access and adapt it to suit new applications and improve the efficiency of existing systems. Universities are called upon not only to generate new knowledge but also to be able to market the innovations that have been generated out of knowledge transferred and adapted. Since this requires an atmosphere of research, libraries are challenged to provide access to relevant information by applying ICTs to facilitate quick, efficient access, integrate and repackage information for the end-user that will capacitate higher educational institutions to conduct research.

Second, the new knowledge economy emphasises that knowledge from wherever it is produced can be transferred to where it is needed. This feature is particularly relevant to Sub-Saharan Africa where there is little access to knowledge and consequently the continent's minimal contribution to global knowledge development. The librarian must be able to retrieve knowledge from wherever it has been generated to where on the continent it can be effectively applied.

Similarly, the library must be able to disseminate the end-product of research activities wherever it is needed for application. The librarian becomes a colleague in research and would need to be more involved in curriculum planning and development if he/she is to be able to effectively identify and provide access to relevant knowledge. The librarian would need to be equipped with modern information retrieval skills and be sufficiently educated to determine the information that is relevant to the end-user. The need to acquire competence in information retrieval skills is reinforced by the fact that librarians need to train their patrons in modern information retrieval strategies particularly in the use of the Internet, the World Wide Web, both on and offline electronic databases and many more. It is

impossible to impart to others the skills that one does not possess.

The new knowledge environment adds variety to information resources and librarians need to promote, particularly, resources that are available in electronic format. Their non-linear, non-sequential arrangement make for ready and speedy access, a quality that is cherished by patrons who are eager to save time.

Personnel

In addition to what librarians can do in impacting research skills to clients, universities need to train and provide sufficiently skilled personnel who can teach students and researchers with ICT skills and also create online information relevant to the development of Africans. This need has been stressed repeatedly by several writers. Such human resources are needed if tertiary institutions in Sub-Saharan Africa are to contribute to the global information society.

Improved Telecommunications Infrastructure

It is important to equip libraries for efficient searching of online information databases and other electronic resources. Reliable and fast Internet connectivity, local and wide area networking are necessary. University authorities need to give priority to developing the library information infrastructure. For institutions located in areas with poor infrastructure, Internet connectivity enhancing gadgets should be installed to facilitate speedy access to the Internet and the World Wide Web. Many Internet service providers are coming up with innovative ways to defeat the constraining telecommunications infrastructure in most African countries. Many are applying direct satellite connection and wireless links especially in parts of Africa where technological infrastructure are few and unreliable. Such connections should not be too expensive for students. Many students in African universities can hardly support themselves financially; thus Internet services should be provided at affordable prices to them. Otherwise, many will shy away from the service and will end up graduating from the university without developing skills to access global information, and consequently unable to contribute to the development of new knowledge and innovations. With good Internet connectivity, institutions in Sub-Saharan Africa can join several global information consortia and also benefit from global information networks.

Conclusion

Information communications technologies are rapidly transforming economic and social development in societies of the world that have access to information. They have the capacity to bring Africa into the limelight and accelerate economic and social growth, but the university administration needs to provide a conducive

atmosphere for information flow and growth. Libraries as gateways to global information networks are central to providing such access. To achieve this, learning must be resource-based and libraries must be well funded. Information literacy must be promoted among all library users to equip them with the skills to determine, access and process relevant information. Above all, libraries need to work in partnership and collaborate with other organisations for maximum access to information.

References

- Castells, Manuel (1993) *The University System: Engine of Development in the New World Economy*. In: Angela Ransom, et al. (eds.) *Improving Higher Education in Developing Countries*. Washington, D.C.: The World Bank, p. 68
- Davenport, Paul (2000) *Development and the Knowledge Economy*. In: Bourne, Richard (ed.) *Universities and Development*. London: ACU, pp.32, 7, 77.
- Hargreaves, Andy, ed. (1997) *Rethinking Educational Change with Heart and Mind*. Alexandria, Virginia: ASCD, pp. 12-17.
- <http://wwics.si.edu/NEWS/speeches/larson.2htm>
- <http://www.inasp.org.uk/newslet/feb02.htm/>
- <http://www.avu.org/ufl/tanzania.htm>
- Kachel, D. (1993) Document Delivery and School Libraries. *Wilson Library Bulletin* (Feb 1993), pp.45-48
- Larson, Alan (2000) (<http://wwics.si.edu/NEWS/speechers/larson2.htm>).
- Mehta, Goverdhan (2000) Science and Technology. In: Bourne, Richard, ed. *Universities and Development*. London: ACU, p. 52
- Millar, Jane (2000) Knowledge Information Technology. In: *The Commonwealth Reference Book 2000/01*. London: Kensington Publications, p. 56
- Summary of Higher Education News. *The Bulletin*, no.149, (Oct 2001), p. 5
- Swartz, Derrick (2000) The State of Universities in the Commonwealth. In: Bourne, Richard, ed. *Universities and Development*. London: ACU, p.41
- Talab, R.S. (1992) General Trends in New Technology Usage: Status of Copyright Development on a National Level. In: Cargill, J. and Graves, D.J. (eds.) *Advances in Library Resource Sharing* Vol. 3. London: Meckler, p 72.
- UNDP (2000) *Human Development Report*. New York: OUP, p.201

World Bank (2000) *Higher Education in Developing Countries: Peril and Promise*. Washington, D.C., pp. 17-18

World Bank (1997) *Revitalizing Universities in Africa: Strategy and Guidelines*. Washington, D.C., p. 2

- * Margaret Adeogun is the Chief Librarian at the University of Eastern Africa, Eldoret, Kenya. She attended the University of Ibadan, Nigeria. She holds M.L.S.



MARGARET ADEOGUN

Assessment of the Use of Information and Communication Technologies (ICTs) in the Financial Sector: A Case Study of the Mozambican Banking System

Flatiel Fabio Villanculos

*Universidade Eduardo Mondlane
Direccao dos Servicos de Documentacao
C.P. 1169
Maputo-Mozambique
Vilanculos@yahoo.com*

and

Kgomotso H. Moahi

*Department of Library and Information Studies
University of Botswana
P/Bag 0022
Gaborone, Botswana
Moahikh@mopipi.ub.bw*

Abstract

This study investigated the extent to which information and communication technologies (ICT) had been used by commercial banks in Mozambique, as well as the benefits of ICTs to banks and customers. Thirty-one managers, fifty-four clerical staff and fifty-eight customers were surveyed. The findings reveal that the use of information and communication technologies was well entrenched in Mozambican banks. This has resulted in the improvement of banking services.

Introduction

The financial sector and banks, in particular, have become primary users of ICTs. As Pennings and Horianto (1992) put it, commercial banks have become major users of information technology, such as computers and telecommunications. The banking sector has become one of the most important users of information technology. According to Pennings and Horianto (1992), information technology in the banking sector consists of back-office automation and transactional-oriented technology. The first includes computer technology (e.g. installation of on-line terminals for tellers

and platform personnel, departmental computing, branch system integration and software upgrades) and telecommunications technology such as the use of satellite and fibre optic networks. Transactional technology is categorised further into Automated Teller Machine (ATM) networks and corporate electronic banking. ATM networks include the introduction of proprietary ATM networks; points of sale systems, examples of this include purchase through debit card in supermarkets, gas stations and national retailer networks; home banking services which include phone banking for bill payments and transfer between accounts. Corporate electronic banking encompasses electronic cash management and clearing houses.

ICTs and Banks

According to Buzzacchi et al (1995), ICTs have played a major role in innovative design of products and services in the last 30 years. This could be attributed to the fact that ICTs have transformed the typical producer-user relationship. Buzzacchi et al (1995) have further indicated that the development of distributed data processing and telematics have tremendously affected the "*technological regime*" that is in place. They distinguish between "mass automation" regime and "smart automation" regime. Mass automation regime primarily focused on back-office automation using mainframes, and was typical of banks in the developed world in the 1960s. Smart automation regime was brought about by distributed data processing and network technologies, which led to an expansion of bank services from a single bank in a single location to networked services over multiple banks in different areas. According to McKendrick (1992), most banks in industrialised countries have largely succeeded in applying ICTs to streamline back-office routines and have since entered a new phase. For instance, in the early 1980s, US banks began to consider how ICTs could be used as a weapon to gain an edge on their competitors. In this regard, ICTs held out the promise of faster and more rigorous analysis in support of a bank's business strategies, helping it to identify a new market, to enter such markets before its competitors did and to maintain higher margins.

The impact of IT on industry goes considerably beyond service quality and productivity. Equally important, it affects the stability of the banking sector and the financial system generally. Experience drawn from the Brazilian Central Bank information system shows that information technologies have played an important role in adding to the banking sector, and in increasing the efficiency of financial markets by helping to populate them with informed agents (McKendrick, 1992). From the above, it is clear that it is a common assumption that automation has a positive impact on productivity by saving time and effort on individual operations and, more generally, by rationalising the work process. In addition, automation goes beyond this by enabling banks to innovate on new products and services tailored towards capturing market share.

Financial Services in Mozambique and the Use of ICTs

Mozambique is a large country in Southern Africa with an area of 784,754 square kilometres and an estimated population of over 18 million people. Mozambique is considered to be one of the poorest countries in the world with over 60% of the people living below the poverty line. The country has had 15 years of destructive war that resulted in the destruction of infrastructure; disrupted banking development to the extent where the banking system operated virtually as an arm of the state budget. Since 1994, which marked the end of the civil war, there has been concerted effort to rebuild the economy. In particular, the banks have tried to resuscitate business. One of the ways to do this was through the adoption of ICTs. In 1978 all private banks operating in Mozambique were nationalised and merged into two state institutions, the Banco de Moçambique (the central bank) and the Banco Popular de Desenvolvimento (BPD). During the 1980s and early 1990s the banking system operated virtually as an arm of the state budget, most credit being directed to loss-making state enterprises.

After 1992, the government's economic reform programme began to tackle the financial sector. Foreign banks were allowed to invest in Mozambique and interest rates were deregulated, the latter being assumed by the newly created Banco Comercial de Moçambique (BCM). The BCM was sold in 1996 and BPD in 1997, as a result of the disappointing results caused by financial indiscipline and poor lending practices. Liberalisation has quickly attracted new entrants into the banking sector. Before 1992, the Banco Standard Totta de Moçambique (BSTM) was the only private bank operating in the country. Since then, it has been joined by the Banco de Fomento e Exterior (BFE), the Banco Internacional de Moçambique (BIM), Banco Comercial de Investimento (BCI). BPD was acquired by a consortium of Malaysian and local investors on privatisation and changed its name to Banco Austral.

A study carried out by Maculuve (1997) found that banks in Mozambique were not customer-driven and were not focussing on services and products to customers. The relationship was simply based on customers depositing and withdrawing their money. The study concluded that using IT might change this relationship to one emphasising product and services to the customer. In other words, the banks should be client or customer-oriented. Maculuve (1997) further argues that ICTs cannot by themselves solve the problems of the banking activity, but they are a basic element in fostering some improvement of the current situation.

In broad terms, Mozambican banks are closing the gap with their international counterparts in the application of information technologies in their work. The impact of the use of ICTs in banks in Mozambique should have been the same as elsewhere. However, Mozambique has a unique history, having experienced nearly 15 years of civil war, which eventually destroyed most of the infrastructure, in particular, communication facilities. Despite all that, the economic liberalisation policy, which

took effect in 1994, has had a profound impact on the growth of the economy. The banking industry, like others, has greatly benefited from this. In line with this new strategy, the Mozambican government has also embarked on projects to improve the technology infrastructures, for example the telephone system. The improvement in the telephone system has been significant to Mozambican business in general and the financial sector in particular.

In spite of ICT penetration into Mozambique banking sector, it is not clear whether the dream of ICT application has been fulfilled or whether it has just been one big spending spree. The introduction of information systems in organisations has in some instances turned out to be a very expensive exercise that has not yielded the expected results (Cane, 1992). Has this been the case in Mozambique or can we tell a different story? In other words, has ICT usage in Mozambican banks been a technological regime of mass automation or a technological regime of smart automation (Buzzacchi et al., 1995)? Has ICT had the effect of automating or informing (Zuboff, 1988)?

As in most business sectors, it is certain that information and communication technology (ICT) exists in the financial sector and especially in the Mozambican banking system. The purpose of this study is to investigate the extent to which banks use ICTs and the impact ICTs have had on bank performance and work processes. The study seeks to determine the kinds of applications for which ICTs have been used, i.e. back-office or development of new products and services. In addition, the study seeks to determine how effectively ICTs have been put to use by the banks in Mozambique.

Methodology

The social survey method was used in investigating the extent to which ICT is used in Mozambique banks. All the seven commercial banks in Mozambique were targeted for the study. However, only three banks were finally used for the study because the other four banks had major problems that were being resolved. The three commercial banks used for the study are: Banco Comercial de Moçambique (BCM), Banco Comercial e de Investimentos (BCI) and Banco Standard Totta de Moçambique (BSTM) registered by the Bank of Mozambique.

Two of the three banks, BCM and BCI agreed that various categories of bank workers could be surveyed for the study while the third bank allowed the study to take place, but with the condition that a questionnaire and an interview be administered only to an executive management advisor, who is also responsible for the implementation of the automation project. Customers of the two banks were also surveyed. This was because it was felt that they could provide information on whether automation of the banks has resulted in improved service as well as created new services and products in the competitive banking systems.

Sampling Procedure

The two banks that agreed to let their branches participate had between them a total of twenty-three branches. BCM had fifteen and BCI had eight. By employing stratified random sampling technique, eight branches were selected, five from BCM and three from BCI. Twenty heads of section were selected (ten from each bank headquarters), all eight branch managers and three IT managers, (one from each of the three banks that participated). From the sample of the branches, a total of thirty-one managers were identified, where sixteen were from BCM, fourteen from BCI, and one from BSTM. The purposive sampling technique was used to select the clerical staff who were there prior to and after automation of the banks (employees who had worked at the banks before automation were selected). Thus fifty-four employees were selected.

For customers of the banks, the quota sampling technique was utilised. The basic requirement for the inclusion in the sample was to have had an account with the branch for not less than six months. For each branch, two working days were spent interviewing customers entering the bank and they were selected by asking every tenth customer entering the bank to complete the questionnaire after being given a brief explanation of the purpose of the administered questionnaire. If the tenth customer was not willing to participate, the next one was targeted. Fifty-eight customers participated in the study.

Data Collection Instruments

The complementary quantitative and qualitative data collection methods were developed to generate an accurate and rich profile of ICT usage by banks in Mozambique. A combination of closed and open-ended questionnaire together with interview guides were used to gather data. The questionnaire for this study was semi-structured in order to gather standardised and general information about the type of technologies used in banks, the level of ICT used, the impact of ICT on work and service to customers. The questionnaire was also used to gather data on factors influencing ICT use and staff perceptions on the overall ICT situation in banks. Qualitative data were gathered through interviews with ICT managers of the three banks, one interview guide was also used. Out of the 139 copies of the questionnaire which were distributed, 101 copies were found to be usable as they were fully completed. This represented 72.6% of response rate. Eighteen of the 31 managers returned the questionnaire, while 25 of the 54 clerical staff also responded to the questionnaire. All the 58 customers responded.

Research Findings and Interpretations

The data collected reflect that out of the eighteen managers, thirteen (72.2%) were from BCM, four (22.2%) were from BCI and one (5.6%) was from BSTM. Out of

the 25 clerical staff that completed the questionnaire, seventeen (68.0%) were from BCM and eight (32.0%) were from BCI. For customers, out of 58, 29 (50.0%) had accounts with BCM and the other 29 (50.0%) with BCI. The indication is that out of 101 respondents, 59 (58.4%) were from BCM, 41 (40.6%) from BCI and one (1.0%) from BSTM. BCM recorded more respondents because a large number of their branches participated in the study due to the sampling procedures. The frequency distribution of managers by departments shows that out of the eighteen respondents, eight (44.4%) were in customer banking department, two (11.1%) were in card centre department and one (5.6%) was in the loans department. Six or 33.3% respondents indicated that they were from various departments, one each from the following: administration, finance, customer support, IT department and bank branch. One respondent or 5.6% did not indicate the department. The frequency data distribution for clerical staff by departments reflects that out of the 25 respondents, sixteen (64.0%) were in customer banking department, while one was in foreign exchange and eight (32.0%) were in different departments such as accounting, branch, customer support, and information systems. This indicates that the customer banking department constituted the largest group.

Background Information

Among the eighteen managers, nine (50.0%) attained college education (this means pre-entry to the university, a period of two years), six (33.3%) had university degrees and three (16.7%) only attained secondary school. Clerical staff were also requested to indicate the highest level of education attained. The data analysis indicates that a majority of twenty-two (88.0%) had at least attained college education, two (8.0%) secondary school and only one had attained university education. The data collected on customers showed that twenty-six (44.8%) had college education, twenty-five (43.1%) university education, six (10.3%) secondary school education and one (1.7%) did not disclose the educational level. The average education of the participants was that at least fifty-seven (56.4%) attained college education, thirty-two (31.7%) university education and eleven (10.9%) secondary school education.

When the bank managers and clerical staff were asked to indicate the positions they held in their various banks, four or 22.2% indicated that they were branch managers, three or 16.7% were deputy branch managers, and seven or 39.2% held various positions like director, financial director, head of department, IT coordinator, IT manager, manager, and regional coordinator. At clerical staff level 2 (8.0%) were account clerks, ten (40.0%) were cashiers, four (16.0%) were systems analysts and the other nine (36.0%) did not disclose their positions.

The managers and clerical staff reported that their working period at the banks ranged from less than one year to over seven years. Out of the eighteen managers who responded to the questionnaire, one (5.6%) had worked for less than one year, three (16.7%) were within one to two years range, two (11.1%) were in three to four years

range and twelve (66.7%) said they had been employed by the banks for over seven years.

The study also sought to establish whether the managers and clerical staff had any computer training. The majority of the respondents, thirty-four (79.1%) had had computer training. The findings further showed that before joining the bank, ten or 55.6% of the managers had experience in the use of ICTs. On the other hand, eleven or 44.0% of the clerical staff had competence in the use of ICTs. This means that out of the forty-three respondents, twenty one or 48.8% had experience with the use of ICTs before they became employees of the banks.

Kinds of ICTs used in Mozambican Banks

The findings of the study showed that most of the banks in Mozambique used personal computers, fax machines and phones as part of their hardware. They also used databases, the Internet, LANs, AS400 software, electronic mail, and text processors. Most respondents indicated that they used databases and LANs because typically banks maintain databases of their customers' accounts and transactions. In addition, banking systems need to be connected into some kind of networks to facilitate communication for services such as ATMs. The banks studied began serious use of ICTs in 1997. The banks also used packaged rather than self-developed software to automate their routine work.

Information and Communication Technologies Usage in Banks

The findings reveal that the banks used different types of ICTs for different activities which enabled them to run their business and maintain efficiency and a high quality service to their customers. Disaggregating the findings by individual routines, as presented in table 1 below, one notes that ICTs were mostly used for cashing cheques, processing statements, ATMs and management of foreign exchange. However, there is also an indication that ICTs were deployed in activities such as processing letters of credit, tracking loan documents, management reports, branch office reporting, corporate banking, home banking services and point of sale systems although to a lesser extent. This clearly shows that for most of the routine work, banks in Mozambique made extensive use of ICTs.

Table 1: Use of ICTs in Banking Activities

Activities	Frequency	Per cent
Cashing cheques	35	89.7
Processing statements	30	81.1
Processing letters of credit	15	40.5
Tracking loan documents	18	48.6
Managing reports	12	32.4
Branch office reporting	14	38.9
Management of foreign exchange	19	51.4
All routines performed manually	9	25
Corporate banking	8	21.6
ATMs	29	74.4
Point of sales systems	4	11.1
Home banking services	15	40.5

Some branches were still not completely automated because there were some indications that some of the activities such as cashing cheques, processing statements and tracking loan documents were still performed manually. Other areas of ICT use were asset/liability management, product development and managing customers information. These areas are essentially non-routine and have a direct bearing on bank customers. The above findings show that ICT use in Mozambique has not only been applied to streamline back office routines, but has also been applied to front-end services that directly impact on customers.

Although most of the banks in Mozambique had their back-office activities automated, they were however in the position of providing automated front-office services such as cash card, phone banking, cashing checks, processing statements, processing letters of credits, tracking loan documents, ATMs point of sale system and home banking services.

Electronic Banking Services

The study found that automated services like lending, leasing, credit finance, trade finance, counter trade, credit card operation and debit card service were offered in the banking system in Mozambique. Other services such as mortgage lending, insurance underwriting, venture capital, credit card operations, private banking, telephone banking and small business advisory were also being offered although not at the same level. The types of service available for customers and mostly used were cash card and cheque account, whilst credit card and phone banking were least used. This might be related to the fact that most of customers were not aware of the existence of the

services. Some customers had difficulties with the use of cash card and as a result there was a major preference of payment by cash among respondents. This could be attributed to the fact that in Mozambique, banks had not yet started providing dispensary payment services as in most other countries. The insecurity resulting from political instability in the country, as well as the low stage of ICT advancement in Mozambique may have contributed to this. As a result, people carry huge amounts of money for their daily transactions. Mozambican banks still lag behind in terms of electronic banking services.

Impact of ICTs on Banks

The findings show that the majority of respondents were of the view that the use of ICTs in banks had produced savings for the banks. The clerical staff also expressed that the use of ICTs had reduced the number of clerical staff, while management were almost unanimous in indicating that there was no change. The study found that banks had reduced the employment of tellers and had converted many of the remaining teller positions into part-time jobs.

The study also found that the use of ICTs in Mozambican banking system had resulted in faster access to information, improvement in quality of service, increased speed of work, speed in communication, and improved productivity. However, the use of ICTs did not seem to have had the same impact in terms of reduction of labour costs and linking together remote offices. There were divergent views between management and clerical staff in relation to reduction of customer complaints (see table 2). The management were of the opinion that the use of ICTs have reduced complaints from customers while clerical staff and mostly those who were in direct contact with customers were of the opinion that it had actually led to increased complaints.

Table 2: Perception of the Benefits of ICT by the Respondents

Activities	Managers		Clerical staff	
	Number N=18	Per cent	Number N=25	Per cent
Faster access to information	16	88.9	20	80.0
Improved service quality	15	83.3	17	68.0
Increased speed of work	14	77.8	16	64.0
Increased speed of communication	15	83.3	14	56.0
Reduced cost of operation	9	50.0	4	16.0
Reduced labour costs	7	38.9	11	44.0
Improved productivity	13	72.2	14	56.0
Link together remote offices	8	44.4	6	24.0
Reduced customer complaints	12	66.7	9	36.0

Impact on Bank/Customer Relationship

The findings indicate that the automation of banks did not play much role in terms of influencing the patronage of bank for customers. This could be due to the fact that the majority of respondents were customers of the banks before automation. The findings indicate what influenced client's patronage to include the quality of the bank staff, location of the bank and the quality of the advertisements. The services that were highly rated by customers included lending, leasing, mortgage lending, insurance underwriting, credit finance, trade finance, counter trade, credit card operation and debit card services. However, other services such as insurance brokerage, venture capital, private banking, telephone banking and small business advisory were also indicated to be available for customers though on a small scale. More importantly, customers were of the opinion that ICTs have improved the communication between banks and customers thereby improving services. ICTs have contributed to a change in bank/customers relationships where the emphasis of banks is on products and services to the customers. Customers expressed that the use of ICTs had promoted faster access to information, increased communication, and reduced their complaints somewhat.

Perceived Problems of Banks Using ICTs

The study found that in the Mozambican banking system problems such as lack of trained personnel in the use of ICTs, high cost of systems development and resistance to change were the major perceived problems of ICT use in banks. However, other factors such as systems security and inadequate customer awareness were also indicated as influencing the use of ICTs in banks. Some clerical staff indicated that lack of training of personnel was a problem. However, they did not find system security, cost of developing the systems, resistance to change and systems breakdown as serious problems. This could be due to ignorance of systems development and systems security by most of the clerical staff.

Conclusion and Recommendations

The results show that banks used different types of ICTs to run their business, maintain efficiency and a high quality service to their customers. The use of ICTs played a multi-faceted and important role in commercial banking in Mozambique. The study established that most of the banks' back-office activities were automated and this resulted in the automation of front-office services and provided automated services for customers. There was evidence that competition improved the quality of services offered to customers, optimisation of routine work, diversification of services to customers and provision of new services for customers in the Mozambican banking industry. The automation of bank routines and consequent move from back-office to the provision of front-office services had enhanced service quality and

brought about productivity gains. Automation had lowered costs and spurred productivity. The impact of ICTs on the industry went considerably beyond service quality and productivity. The study found that the use of ICTs promoted fast access to information, improved service quality, increased speed of work and communication, reduced cost of operation, and improved productivity. The use of ICTs also resulted in less routine work for top management, technical managers and junior managers.

The recommendations, which follow, suggest how some of the constraints to ICT use at the banks could be overcome. If it is to be used to the maximum, particular attention should be given to training of staff and management as well as the way in which the technologies are implemented and managed. It is recommended that the managers be trained on how to manage in an ICT environment. The managers need a sound technical knowledge and an understanding of the subtle relationship between people and technology at the organisational level, because the introduction of ICT is an innovation that often brings about major organisational changes. It is also recommended that management should allow employees with some level of ICT literacy to participate in ICT related decisions. The staff could be involved in the analysis and discussion of what technology could do to people and their working lives, the location of hardware and software resources within the company, as well as employee involvement in work redesign. It is also important that staff be consulted about, or be encouraged to participate in the selection, development and application of ICT. Participation is likely to instil a sense of belonging, reduce resistance and result in full exploitation of the technologies as well as increased productivity. Previous research studies suggest that when those involved or affected by computerisation have a common understanding of the need for the new technology and perceive it as a solution to problems, there is less likelihood of outright resistance to change (Mirvis et al, 1991). The participatory process may be in the form of a technology steering committee or multi-level task force to oversee the introduction and implementation of the new technologies.

References

- Buzzacchi, L., Colombo, M. G. and Manotti, Sergio (1995) Technological Regimes and Innovation in Services: The Case of the Italian Banking Industry. *Research Policy*, 24: 151-168.
- Cane, A. (1992) IT and Competitive Advantage: Lessons from the Developed Countries. *World Development*, 20 (12) 1721-1736.
- Maculuve, P. F. (1997) O Papel da Informática Na Actividade Bancária. *Staff Paper 5* (9) 39-42. Maputo, Banco de Moçambique.
- McKendrick, D. (1992) Use and Impact of Information Technology in Indonesia Commercial Banks. *World Development*, 20 (12) 1753-1768.
- Mirvis, P. et al. (1991) The Implementation and Adoption of New Technology in Organisations: The Impact on Work, People and Culture. *Human Resource*

Management, 30 (1) 113-139.

Pennings, J. M. and Horiato, F. (1992) The Diffusion of Technological Innovation in the Commercial Banking Industry. *Strategic Management Journal*, 13: 29-46.

Zuboff, S. (1988) *In the Age of the Smart Machine: The Future of Work and Power*. New York: Basic Books.

- * Flatiel Fabio Villanculos is a senior librarian at Universidade Eduardo Mondlane Direccao dos Servicos de Documentacao, Maputo-Mozambique. He attended the University of Botswana. He holds BLIS and MLIS degrees.

Kgomotso Moahi is a senior lecturer in the Department of Library and Information Studies, University of Botswana. She attended the University of Botswana, University of Sheffield, UK and the University of Pittsburgh, United States of America. She holds BA, MA and PhD degrees.



KGOMOTSO H. MOAHI

The Management of Systems Migration in an African Setting

Y.A. Adedigba and E.O. Ezomo

Library and Documentation Centre

International Institute of Tropical Agriculture

Oyo Road, P.M.B. 5320

Ibadan

E-mail: Y.Adedigba@cgiar.org; E.Ezomo@cgiar.org

Abstract

The Library and Documentation Centre of the International Institute of Tropical Agriculture (IITA) migrated to a new integrated library software in 1997. This article gives reasons for the change, describes the selection process, the migration to INMAGIC DB/Textworks and conversion of records. Also, the problems encountered, publicity, training of library staff and users and future plans are outlined.

Introduction

The International Institute of Tropical Agriculture (IITA) was founded in 1967 with the mandate to develop sustainable production systems in Sub-Saharan Africa for specific crops. The mandate crops are maize, cassava, yam, cowpea, soya beans, plantain and banana. IITA is the first African link in the worldwide network of agricultural research centres known as the Consultative Group on International Agricultural Research (CGIAR) which was founded in 1971. The CGIAR now consists of 16 centres worldwide.

The Library and Documentation Centre of IITA was established in 1969. It is one of the seven units of the Communications and Information Services Programme of the Institute. Its existing organisational structure encompasses three sections; namely, Collection and Database Development, Users' Services and Photo Library.

The Library collection contains mainly literature on tropical agriculture, related applied sciences, social sciences relevant to agriculture and a few publications in the humanities, engineering and medicine. The small collection in the non-core areas is to cater for the needs of the support staff. As at November 2002, the Library's database consisted of the following: Analyticals, 16,545 volumes; Annual Reports, 601 titles; Articles, 60,226 records; Books, 33,832 volumes; CD-ROM, 15 titles; Diskettes, 5

titles; Journals, 1,813 titles; Maps, 52 records; Pamphlets, 9,264 volumes; Poster, 1 record; Video, 2 records.

The total number of records in the Library's database was 122,608 and the current journal titles on the Library's subscription list was about 180. Slides (about 2244) and microforms (about 15,110) were not yet represented in the Online Public Access Catalogue (OPAC). A separate database is being developed to cater for them.

The Library had four professional librarians, and six support staff. The services offered include circulation and reference, computer searches, electronic document delivery, referral service, photocopying service, selective dissemination of information (SDI), outreach services, training and compilation of specialised abstracts and bibliographies.

In addition to its primary function of providing the educational and reference materials to its staff, trainees and collaborators need good and efficient performance. The IITA Library grants reading privileges to researchers outside IITA.

The Library services of IITA were computerised in 1984. The services include the acquisition, cataloguing, circulation and online public access, compilation of bibliographies, current awareness services including selective dissemination of information (SDI). The system was integrated in two ways - by accommodating records of all forms of publications in a single database, and through the unification of operational records. All the modules were linked. Lawani et al (1992) outlined the specifications of the system, described the process which led to the selection of Battelle Automated Search Information System (BASIS) as the software package and reported the procedures adopted and the problems encountered in the retrospective conversion of the card catalogue records.

BASIS was selected because it met all the requirements of the library. Being a modular system with a central module and many optional modules, it was suited to the processing and retrieval of large bibliographical data. Apart from meeting the information needs of the Library and Documentation Centre, it was also used to implement various other information systems for other departments of the Institute. This diversity of potential applications was a strong factor in the selection of BASIS at that time. Three other sister institutes - Centro Internacional de la Papa (CIP) in Lima, Peru, Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT) in Mexico and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India installed BASIS in 1995 and benefited from the discount negotiated by IITA with a subsidiary of Battelle Memorial Institute known as Information Dimensions (Lawani et al, 1992).

In 1994, the IITA's management decided to replace its VAX minicomputer on which the Library's computer software was supported and with a local area network (LAN)

of micro-computers. The reasons for the institute's decision to do away with the VAX included obsolescence of the hardware, high on-going maintenance costs of the hardware and the need for improved technology. The Library's professional staff therefore started to search for an alternative system to BASIS. Doering (2000) has enumerated the advantages in the involvement of the staff of any library in the selection process. They include increased staff morale, motivation, commitment and support of the new system. When VAX was to be phased out, the option of looking for another hardware to support the Library's database on BASIS was not considered because the leadership of the library had opted for the same hardware as the Institute to make maintenance easy.

The objective of this article is to share the library's experience in systems migration with colleagues in Sub-Saharan Africa and beyond who may wish to automate their libraries or change from one system software to another. This is to be expected as the library has over the years given individualised training on library management and automation. IITA had trained librarians and other information professionals from Benin Republic, Cameroon, Ghana, Liberia, Togo, Sierra Leone, Kenya, Uganda and various states of Nigeria (Adedigba et al, 1995).

Systems migration may be defined as the process of replacing one automated system with another. The aim was to move the library's database to the new system without causing any interruption to the normal library functions.

Selection of an Alternative System

Given the past experience of the Library, the staff formulated some broad software selection criteria. These are (i) ability to accommodate smooth conversion of the existing database with of over 107,000 records; (ii) user-friendliness, like BASIS; (iii) residence on a network of micro-computers; (iv) flexibility for staff to perform in-house changes without having to depend on specialised technical support; (v) availability over the Internet and (vi) reasonably low purchase price and maintenance costs.

Information was obtained from the literature and various information systems developers and marketers. Also, the staff contacted/visited other computerised libraries to evaluate their systems. It was found that the special issues of the journal entitled *Electronic Library* were particularly useful because they contained information on new computer hardware and software.

The decision in 1994 to establish the criteria for the new system, devise a search strategy that included discussion with vendors and caution in assessing the information given by the various vendors have been supported by McIntyre (1999).

The proposed applications remained the same as we had with BASIS. They are:

- Searching and retrieval of library records by various fields
- Cataloguing of library materials
- Circulation control of library materials
- Serials inventory and control
- Printing of output in various formats from the results of searches
- Thesaurus check (Commonwealth Agricultural Bureaux (CAB) Thesaurus)
- Sorting of records according to various fields
- Data input (both batch and interactive).

A number of alternative software, particularly Micro CDS/ISIS, MINISIS, TINLIB, DYNIX, INNOPAC, TECHLIB PLUS and INMAGIC DB/Textworks were considered.

MICRO CDS/ISIS

CDS/ISIS - Computerized Documentation System Integrated Set for Information System. An advanced non-numerical information storage and retrieval software developed by UNESCO.

In August 1993, the United Nations Educational Scientific and Cultural Organisation (UNESCO) designated IITA Library as a distribution and training centre for CDS/ISIS software. Since then, the Library has distributed it to other libraries and trained several librarians on its installation and use. At the IITA Library, the software is used for the contribution of IITA records to AGRIS (the FAO-sponsored agricultural bibliographical database) and for IITA's contribution to the International Agricultural Research Centres (IARC) Union Catalogue of Serials. Some major limitations in Micro CDS/ISIS are that it is not meant for large-scale databases, not flexible and not user-friendly. Also, it does not have vendor support. Consequently, it was rejected as it was not considered as a good alternative to BASIS.

MINISIS

MINISIS is a dynamic toolkit which can aid any organisation in satisfying its text-based information management requirements. The MINISIS software offers a suite of functionality which includes:

- * multilingual user interface and data processing
- * full screen data entry, batch modification and data validation
- * extensive and powerful retrieval, including thesaurus-based searching
- * powerful report writer
- * multi-platform, multi-user operation
- * exchange of information using internationally recognised standards
- * flexible relational database structure definition and maintenance

- * comprehensive customisable on-line context-sensitive help
- * world-wide distribution and support network
- * products and application development environment.

Additional details at <http://www.minisisinc.com> <<http://www.minisisinc.com>. A PC-based version was being developed by the International Development Research Centre (IDRC) of Canada and it was not yet available when an alternative software to replace BASIS was being sought for.

TINLIB

The Information Navigator Library (TINLIB) was already being used at the Nigerian Institute of International Affairs (NIIA) Library and the University of Ibadan (UI) Library. The software was already selected by the National Universities Commission (NUC) for system-wide use in Nigerian federal universities. However, no CGIAR Centre was using it.

From discussions with users of TINLIB in Nigeria, it was realised that although it is integrated and could run on a network of micro-computers, it has some disadvantages. For example, there is a heavy reliance on the title field, the key field. TINLIB cannot be programmed to produce reports in a more flexible format except to download it to a word processor and manipulate it to get the desired formats. Its two manuals were written in such a way that the Database Administrator (DBA) is perpetually dependent on the TINLIB agent. This is unlike the BASIS manuals where with practice the DBA could solve most problems. On the whole, it was concluded that TINLIB would not serve the purpose of the library as adequately as BASIS.

INNOPAC

Innovative Interfaces Online Public Access Catalog (INNOPAC). A special issue of the journal entitled *Electronic Library* showed that the International Rice Research Institute (IRRI) in the Philippines had adopted INNOPAC. It was however discovered that it is mini computer-based and quite expensive. Subsequently, it did not qualify for consideration because we were searching for a micro-computer-based system.

TECHLIB

TECHLIB is an integrated solution for managing library resources and automating daily library operations. TECHLIB has qualities similar to BASIS. Thus, the conversion of IITA's database records from BASIS to the new system would have been easy. One of the options considered was TECHLIBPlus on a 486PC running on UNIX SVR4 in a LAN environment. The quotation given for the software in 1994 was \$56,000. Also, IITA Library would need to purchase a UNIX operating system if TECHLIBPlus was selected as the alternative system to BASIS. It was however

realised that the library's budget could not accommodate such an expensive software with the appropriate operating system.

DYNIX

DYNIX - Automated library system which allows users to access the library catalogue, community information, CD-ROM applications, and a myriad of library-defined, web-based resources with easy-to-use text, web interfaces. It is an integrated system which is compatible with micro-computers in a LAN environment. However, the price quoted for it could not be accommodated by the Library's budget. At the time of the search, none of the CGIAR Centres was using it. It was also found that no library in Nigeria had adopted it. In that case, it was thought that maintenance could be a problem.

INMAGIC

INMAGIC DB - Inmagic's DB/Textworks-based solutions use text bases to provide unparalleled flexibility, robustness and speed when organising, searching and retrieving text, images and multi-media.

Enquiries were made from International Water Management Institute (IWMI), a sister centre in Sri Lanka which at that time was already using INMAGIC Plus for the creation, maintenance and information retrieval activities of its bibliographical databases. The IWMI Librarian was satisfied with the software. CIMMYT also migrated from BASIS to INMAGIC DB/Textworks in 1996. De Gracia et al (1997) described CIMMYT's migration and the impact of that software on various management activities. A demo disk and relevant information were obtained from the Marketing and Sales Department of INMAGIC, Inc. Compared with all the packages that had been evaluated, it was found that INMAGIC DB/Textworks has the following advantages in that it :

- is integrated
- has a reasonable price (about \$8,000) with no maintenance charge
- Was already adopted by two CGIAR Centres and over 30,000 institutions worldwide
- has a user-friendly Windows-based interface
- has a web-browser for access over the internet. (obtainable at extra cost)
- has web publisher for uploading the library's in-house database on internet (obtainable at extra cost)
- has low upgrade cost
- allows searching to be done using Boolean operators
- allows search terms to be posted from the index
- allows complex report generation

- gives freedom to experienced library staff to make modifications to suit any purpose without relying on the Institute's Computer Centre
- has the possibility of easy and smooth data conversion by exporting data from BASIS to ASCII files and then transferring them to INMAGIC DB/Textworks.

The Migration

In December 1996, a decision was finally made to select INMAGIC DB/Textworks as the Integrated Library System to replace BASIS.

By 1995, the cables to connect the Library to the Institute's LAN had been laid. INMAGIC DB/Textworks software was finally purchased in 1997 and it was to run on a local area network (LAN) of micro-computers.

IITA has a full-fledged Computer Centre that handles all computerisation projects of the Institute. It was therefore the responsibility of that Unit to move the Library data. There was a high demand on the time of the staff of the Computer Centre because some other departments were also moving their databases to new systems. Therefore, in order to overcome the threat of losing the data due to a possible breakdown of the VAX, the Computer Centre hired a consultant to handle the Library project. Neither he nor any library staff was familiar with the INMAGIC software. The consultant and the Database Librarian had to study the three manuals that came with the software to make a headway.

The Database Librarian, apart from being a librarian by training, also had some training in computer science. This was an advantage as it helped the librarian to understand the consultant as well as offer advice on the expectations of the library's clientele. The consultant was very friendly and co-operative. He discussed the importance and relevance of the fields to be downloaded. It was agreed to use all the 38 fields and fieldnames as was used in the old system. The server on which the records were downloaded was situated in the Computer Centre. Due to the large size of the database, downloading the records was time-consuming. Most times, the activity continued overnight.

After the records had been downloaded, the consultant and the Database Librarian designed the "Menu Screens" and the "Forms" that would be used to display and retrieve information from the database. The menu screens and forms that are available to library users contain only fields that allow for searching and printing. However, for the library staff, apart from searching and printing, they could also edit records. After a fair understanding of the new system, the Database Librarian prepared a documentation to assist the library staff in the use of the new system (Ezomo, 1999). For security reasons, the copy of the software was updated on a daily basis and was put on a different server from the copy that would be available to library users. The

arrangement was that the Computer Centre would update the users' copy regularly. The library staff database was also password protected.

With the server in place, the INMAGIC retrieval software which was on the network had to be installed on every PC to enable any IITA staff search the library database regardless of their location within or outside the library.

Problems

1. The manuals do not adequately cover some aspects of library applications like serials tracking. The result is that this activity is still manually done in the library. After the establishment of the new system, the consultant contacted the developers of INMAGIC to get some information that could solve the problem but it did not help.
2. There was no formal training by the makers of the new software or even by those who were familiar with it. The provision for the training of staff was omitted by the Computer Manager who purchased the software and arranged for a consultant without any arrangement for staff training.
3. In using the software, one of its disadvantages is that when a large number of records have been retrieved, if any of them is to be omitted from a printout, each has to be omitted on the display screen. This could be tedious depending upon the number retrieved and the number to be omitted.

Training of Library staff and users

As recommended by Hallmark and Garcia (1992), the importance of training of library staff and users as well as the announcement of the migration was considered important. The training of the library staff was done in-house and on the job with the aid of a sort of "step by step database documentation" that had been prepared. All library staff were already experienced in the use of computers and the use of the old system. Consequently, it was not too difficult to adapt to the new system especially since INMAGIC DB/Textworks is very user-friendly. The staff had a positive attitude and the expectation was high since the VAX had been decommissioned. After the library staff had been trained, the publicity of the new system was made in the Institute's weekly bulletin and a seminar was held to introduce and demonstrate the new system. Thereafter, any user who still had problems using INMAGIC was assisted on a one-to-one basis by the library staff.

Some Benefits of the Migration

The computerisation has made the operations of the library easier, faster and more efficient resulting in increased user satisfaction. The frequent breakdown due to obsolescence of the VAX has been eliminated. In addition, the OPAC is easy to use as INMAGIC is user-friendly. Searching of the library database can be done not only

in the library but from any of the computers connected to the institute's LAN. In effect, one can search the library collection even when the library is closed.

For operations relating to acquisitions, pre-order checking, vendor monitoring, recording and correspondence have been made easier, faster and more efficient. A book is recorded only once, i.e. in the acquisition module. Every other information generated for such a book during cataloguing and loan transactions would only involve addition or subtraction from the existing record. Overdue notices are printed from the system and bibliographies can also be produced easily. In addition, selective dissemination of information (SDI) service is made easy. Profiles that represent each scientist's area of interest are run periodically against the new additions to the library database to retrieve relevant items. The updates on the library database are then sent to the scientists.

Future Plans

In the five years of the migration it has become obvious to the library that it has to:

1. upgrade INMAGIC DB/Textworks from version 2.0 to version 5.2 which is the latest.
2. upload the library database on the Internet using the Web publisher hosted by CGNET. (CGNET is the electronic mail network of the CGIAR. It provides reliable and cost-effective wide-area connectivity and other communication services to globally distributed organisations.)

Conclusion

The migration of IITA Library and Documentation Library database from BASIS in a minicomputer-based environment to INMAGIC DB/Textworks in a Local Area Network of micro-computers was successful. Both staff and library users have expressed their satisfaction with the application of the software. It could also be inferred that nine out of the sixteen CGIAR centres were using the software as at October 2002.

References

- Adedigba, Y.A. et al (1995) Education and Training in Library Automation, IITA's Contributions. *African Journal of Library, Archives and Information Science*, 5 (1) 55 - 64.
- De Gracia, C. et al. (1997) Selecting and Adapting a Second-Generation Integrated Library System (ILS) and Extending it to Users World-Wide Via the Internet. *IAALD Quarterly Bulletin*, 42 (3 & 4) 147 - 156.

- Doering, W. (2000) Managing the Transition to a New Library Catalog: Tips for Smooth Sailing. *Computers in Libraries*, 20 (7) 20 – 22.
- Ezomo, E.O. (1999) A Staff Manual for The IITA Library Database Use and Maintenance on Inmagic DB/Textworks. 19 p. (Unpublished.)
- Hallmark, J. and Garcia, C.R. (1992) System Migration: Experiences from the Field. *Information Technologies and Libraries*, 11(4):345 – 358.
- Lawani, S.M.; Azubuike, A.A. and Ibekwe, G.O. (1992) Large-Scale Library Automation: An African Success Story. *African Journal of Library, Archives and Information Science*, 2 (1) 1-16.
- McIntyre, K. (1999) The Second Time Around: Lessons in Migrating A K-12 Library Automation Program. *Texas Library Journal*, 75 (1) 28 – 31.

- * Y.A. Adedigba is the Head of Library and Documentation Services, International Institute of Tropical Agriculture, Ibadan, Nigeria. He attended the University of Denver, Denver, Colorado; USA. He holds M.A. and A.L.A.

E.O. Ezomo is Principal Librarian (Collection and Database Development), International Institute of Tropical Agriculture, Ibadan, Nigeria. She attended the University of Ibadan, Nigeria. She holds B.Sc., M.L.S. and Post-graduate Diploma in Computer Science.



Y.A. ADEDIGBA



E.O. EZOMO

Internet Access Competence and the Use of the Internet for Teaching and Research Activities By University of Botswana Academic Staff

Ayoku A. Ojedokun and Emmanuel O. Owolabi

University of Botswana

P/Bag 0022

Gaborone, Botswana

E-mail: Ojedokun@mopipi.ub.bw

E-mail: Owolabi@mopipi.ub.bw

Abstract

The Internet is dramatically changing the world of research and teaching. However, academics would have to learn new skills on Internet use to fully transform their research and teaching. The objective of the study, therefore, was to assess the impact of Internet competence on the use of the Internet for teaching and research activities among the academic staff of the University of Botswana. A total of 216 academic staff participated in the study. A specially designed questionnaire with open and close-ended questions was used as the main instrument for data collection. Data were analysed for frequency and percentage using the cross-tabs sub-program of the SPSS. The study showed that many of the respondents were skilled users of the Internet only as far as its application in research activities was concerned. This was essentially in the area of literature and supporting/baseline data searching. They seemed not to be as skilled in the use of the Internet to enhance teaching activities, such as delivering additional lecture notes and sending files to students. The study therefore recommends that for the University of Botswana to derive maximal benefit from its investment in personal computers and Internet access for its academic staff, it is imperative that training programmes be organised for the academic staff on Internet use for teaching and research.

Introduction

The Internet has become an invaluable tool for learning, teaching and research (including collaborative research). According to the prediction of Alan Pritchard, cited by Russell (2000), as new technologies transform classrooms over the next 20 years, teachers will have to change their teaching styles and acquire Internet

skills. Teachers will need to learn new skills to teach students how to search for and use information from the Internet and about superhighway safety. Preston (1998) describes some of the Information Technology (IT) products that will be used in the classroom of the future to include electronic whiteboards, which will enable a teacher to write on the board in the conventional way while interacting with the computer at the same time; delivery of lesson notes in the form of interactive presentations, which will be projected onto the whiteboard incorporating video, animation and sound; and Liquid Crystal Display (LCD) projectors, which will be used in a similar way to project video images and live television. Similarly, detachable LCD displays from laptop computers will be used to give presentations using an overhead projector. In order to use these tools effectively, the new set of skills that scholars must develop, therefore, include strategies to search for relevant materials, skills in evaluating the quality of documents found, knowledge of web design, skills in using discussion forums and chat rooms, and a basic understanding of how to send e-mail attachments (Lacey, 1999).

According to Lacey (1999), few researchers in developing countries have developed all of the skills mentioned above. However, Russell (2000), in his report recognised that some institutions of higher learning elsewhere are already advanced users of information and communication technology (ICT), using cutting-edge technologies such as interactive whiteboards, posting curriculum and homework on the Internet, and making use of video conferencing to share specialist teaching. To develop and/or expand research partnerships, it is therefore necessary to ensure Internet access competence. This should help scholars to develop Internet skills and competences.

The Internet was introduced in the University of Botswana at the end of February 1997 (University of Botswana Annual Report, 1996/97). Since the introduction of the Internet, the University continues to encourage faculties and departments to develop their own web pages, and where possible, set up web servers for publishing to the world through the Internet. The University has also been providing personal computers for all its staff members. The objective of this study, therefore, is to assess the impact of Internet use on the research and teaching activities of staff. The study is significant, especially at a time when efforts are being made by the University to implement e-Learning (electronic learning). The study is further significant as the findings will enable the University to evaluate the achievement of the objective for which every staff member was given a personal computer and Internet access.

Methodology

The total number of academic staff available for the study was 356 spread over all the six faculties of Business, Education, Engineering and Technology, Humanities,

Science, and Social Science. This population of the available academic staff constituted the sample of the study. This was because the number of academic staff was not too large. The data was collected during the second quarter of 2002.

The data collection instrument used for this study was the questionnaire. The questionnaire was structured to clearly identify important measurable variables associated with Internet skills' acquisition and access competence. This included its use to search for literature on a particular study, empirical supporting/baseline data, research methodology, general teaching materials, empirical and supporting materials for teaching, etc. It also includes its use to present course description, and student's referral to the Internet for additional course/lecture materials.

Copies of the questionnaire designed for this study were distributed by post (internal postal system). Two reminders were sent through e-mail. A total of 216 copies of the questionnaire were returned. This represents a return rate of 60.7%. Of the respondents, staff of the Faculties of Business constituted 4.2% (9); Education, 22.2% (48); Engineering and Technology, 4.2% (9); Humanities, 23.6% (51); Science, 31.9% (69); Social Science, 9.7% (21). Some of the respondents, 4.2% (9), did not indicate the faculty to which they belonged. The data collected were analysed for frequencies and percentages using the cross-tabs sub-program of the Statistical Package for Social Sciences (SPSS).

Results and Discussion

Computer and Internet availability

All the 216 (100%) respondents had personal computers in their offices. However, only 135 (62.5%) had personal computers at home (table 1).

Table 1: Computer Availability

Availability	Response	Percentage of Total Respondents N= 216
Personal Computer in Office	216	100%
Personal Computer at Home	135	62.5%
Internet access in Office	204	94.4%
Internet access at Home	33	15.28%

A majority of the respondents, 204 (94.4%), could access the Internet in their offices, while only 33 (15.28%) could access the Internet at home. Similarly, of the total respondents, only 75 (34.7%) had prior computer use training.

Competence in Computer and Internet Use

Most of the of respondents (79.2%) were competent in computer use while 77.8% were competent in the use of Internet resources. It thus appears that computer use competence is associated with Internet use competence. The reason might be that academics associate the need for computer with Internet use. However, of the 171 (79.2%) respondents who could use the computer, only 45 (26.3%) had received formal training on Internet use. Similarly, of the 168 (77.8%) respondents who were Internet competent, only 45 (26.3%) had received prior training on Internet use. It would thus appear that not every respondent who claimed Internet competence had formal training on Internet use. Thus, a majority of those who claimed to have computer and Internet competence might have achieved that competence through self-learning.

Experience on the Use of the Internet

On the experience on Internet use, the study found that 48 (22.2%) respondents had used the Internet for between 1 and 2 years, while 159 (73.6%) had used the Internet for 3 years and upward (table 2).

Table 2: Experience on Internet Use

Years	Number of Respondents	Percentage of Total Respondents N= 216	Respondents with Formal Internet Use Training	Percentage of Total Respondents N= 216
1-2	48	22.2%	9	4.2%
3-5	87	40.3%	33	15.3%
Over 5	72	33.4%	9	4.2%
No response	9	4.2%	-	
Total	216	100%	51	23.7%

Of the 48 (22.2%) who had used the Internet for 1 to 2 years, only 9 (18.8%) had received prior formal training on Internet use, while of the 159 (73.6%) who had used the Internet for 3 years and above, only 42 (26.4%) had received prior formal Internet training. From table 2 it is obvious that a large proportion of the respondents had no formal training on the use of Internet.

Table 3: Frequency of use of the Internet

Frequency	Number of Respondents	Percentage of Total Respondents N=216	Respondents with Formal Internet Use Training	Percentage of Total Respondents N=216
Very Regularly	126	58.3%	36	16.7%
Regularly	42	19.4%	6	2.8%
Moderately	42	19.4%	9	4.2%
Scarcely	6	2.8%	-	-
Total	216	100%	51	23.7%

On the regularity of Internet use, of the 126 (58.3%) respondents who used the Internet very regularly, only 36 (28.6%) had received any training on Internet use prior to the study. Another 42 (19.4%) had used the Internet regularly and out of this number only 6 (14.3%) had received prior formal training on Internet use. Tables 2 and 3 reveal that formal training on Internet use had no significant effect on the frequency of use of the Internet.

Skills Application

E-mail (94.4%) and web browsing (84.7%) were the most popular applications used by the respondents (table 4).

Table 4: Application of Skills

Application	Number of Respondents	Percentage of Total Respondents N= 216	Respondents with Formal Internet Use Training	Percentage of Total Respondents N= 216
E-mail	204	94.4%	45	20.8%
Web	183	84.7%	48	22.2%
Discussion	60	27.8%	15	6.9%
News	84	38.9%	27	12.5%
File transfer	81	37.5%	18	8.3%
Telnet	18	8.3%	6	2.8%

Of the 204 (94.4%) who used e-mail, only 45 (22.1%) had prior Internet training (table 4). Similarly, of the 183 (84.7%) respondents who carried out web

browsing, only 48 (26.2%) had received formal Internet use training. Table 4 also shows that formal training on the use of the computer had little or no effect on using the different applications of the Internet.

Table 5 shows the results on the most used applications on a 3-point scale of *most used* (3), *used* (2) and *least used* (1) applications of the Internet.

Table 5: The Frequency of Use Internet Facilities

Application	Most Used (MU)	Used (U)	Least Used (LU)
E-mail	120 (55.6%)	12 (5.6%)	6 (2.8%)
Web browsing	15 (6.9%)	96 (44.4%)	12 (5.6%)
Discussion	0 (0.0%)	12 (5.6%)	15 (6.9%)
News	9 (4.2%)	12 (5.6%)	21 (9.7%)
File transfer	0 (0.0%)	6 (2.8%)	30 (13.9%)
Telnet	0 (0.0%)	0 (0.0%)	12 (5.6%)

The table shows that of the total respondents, 120 (55.6%) respondents indicated electronic mail as *most used*, while 5.6% cited *used*, and 2.8% claimed *least used*. Similarly, fifteen (6.9%) respondents indicated web browsing as *most used* while 96 (44.4%) respondents indicated it as *used*. Nine (4.2%) indicated the use of Internet for News as *most used*, while 12 (5.6%) indicated it as being *used* and 21 (9.7%) indicated it as being *least used*.

In order to rank the use of the Internet facilities on the basis of regularity of use, the sum of all the ratings was multiplied by the number of respondents for each rating, and divided by the total number of respondents. The final average for each facility was thus computed. The higher the average obtained, the higher the frequency of use since '*most used*' had a weight of 3 (table 6).

Table 6: Ranked Order of Regularity of Use of Facilities

Internet Facilities	Number of Respondents	Average weight
E-mail	138	2.83
Web browsing	123	2.02
News groups	42	1.76
File transfer	36	1.44
Discussion groups	27	1.17
Telnet	12	1.0

The study revealed that the respondents most regularly used the e-mail (2.83) followed by web browsing, and then followed by news group. This is perhaps because e-mail is used in communication with students and lecturers, it is quick and permits transmission of files. For example, e-mail attachments permit near instantaneous transfer of manuscripts, spreadsheets, and some images.

The study also revealed less use of file transfer facility of the Internet (final average = 1.44). This is not surprising as only 26.3% of our respondents were formally trained on Internet use. This submission is reinforced by the fact that none of the respondents picked file transfer as *most used*. What this perhaps suggests is that the respondents were not skilled in the use of this facility. They were therefore unlikely to know how to use this facility to share data sets, organise conferences, jointly write proposals and research papers, and engage scholars on a global basis in dialogue on research issues of interest to them. File transfer through File Transfer Protocol (FTP), supplements e-mail attachments by quickly and cheaply transferring very large files, such as high-resolution images and large databases. According to Lacey (1999), the Internet and e-mail can be invaluable tools to promote collaborative research. E-mail and FTP help researchers in widely separated locations to pursue joint projects.

Internet Skills and its Applications in Teaching and Research

When respondents were asked if they were aware that Internet resources could be used for research and teaching, 159 respondents (73.6%) indicated they had awareness of research resources on the Internet, while 144 or (75.5%) were aware of teaching resources on the Internet.

Application in Research Activities

The study revealed that 132 (61.1%) of the total respondents frequently used the Internet for their literature search, 66 (30.6%) used it regularly for retrieval of supporting/baseline data, while only 27 (12.5%) used it regularly for research methodology (table 7).

Table 7: Regularity of Internet Use in Research

Regularity of Use	Literature Search	Baseline Data	Research Methodology
Frequently	132 (61.1%)	66 (30.5%)	27 (12.5%)
Occasionally	51 (23.6%)	66 (30.6%)	51 (23.6%)
Rarely	18 (8.3%)	39 (18.1%)	63 (29.2%)
Never	12 (5.6%)	42 (19.4%)	69 (31.9%)
No Response	-	3 (1.4%)	6 (2.8%)

Fifty-one (23.6%), 66 (30.6%), and 51 (23.6%) of the respondents used it occasionally for literature searching, supporting/baseline data retrieval, and research methodology respectively (table 7). The study thus revealed that literature search was the most widely used application of the Internet by our respondents.

Application in Teaching Activities

The study showed that only 93 (43.1%) and 84 (38.9%) of the respondents, used the Internet regularly for retrieval of *general teaching materials* and retrieval of *empirical materials for teaching* respectively (table 8).

Table 8: Frequency of Internet Use in Teaching

Regularity of Use	General Teaching Materials	Empirical Materials for Teaching	Course Description Presentation	Referral for Additional Lecture Materials	Delivery of Additional Lecture Notes	Internet E-mail Communication with Students
Frequently	93 (43.1%)	84 (38.9%)	27 (12.5%)	54 (25%)	24 (11.1%)	21 (9.7%)
Occasionally	63 (29.2%)	66 (30.6%)	45 (20.8%)	63 (29.2%)	66 (30.6%)	24 (11.1%)
Rarely	21 (9.7%)	24 (11.1%)	51 (23.6%)	48 (22.2%)	48 (22.2%)	51 (23.6%)
Never	36 (16.7%)	39 (18.1%)	84 (38.9%)	48 (22.2%)	72 (33.3%)	114 (52.8%)
No Response	3 (1.4%)	3 (1.4%)	9 (4.2%)	3 (1.4%)	6 (2.8%)	6 (2.8%)
Total	216	216	216	216	216	216

Only 27 (12.5%) respondents used the Internet regularly for course description presentation while 54 (25%) used it regularly in referral of students for additional lecture materials. Generally, a low percentage of the respondents used the Internet facilities for *presentation of course description, students' referral for additional lecture materials, delivery of additional lecture notes, and communication with students*. The respondents thus appeared not adequately skilled in the use of the Internet for teaching. This therefore implies that as part of the efforts now being made to implement e-Learning at the University, the University authority would have to ensure adequate training of staff in Internet use for teaching to ensure successful implementation.

What is surprising, however, is that while e-mail is the most used facility on the Internet, very few of the respondents 21 (9.7%), *used it regularly* to communicate with their students (table 8). All students at the University of Botswana at the time of this study had e-mail addresses and easy access to e-mail facility (IT Department, University of Botswana, 2001). There is therefore no reason for the respondents not using it to communicate with their students. It can now be deduced that the low level of use of e-mail to communicate with students was perhaps responsible for the outcome of a similar study conducted on students by Ojedokun (2001). The study revealed that only 110 (7.4%) of total respondents used e-mail to communicate with lecturers. In that study, students rated

communication with fellow students, friends and relatives high. One would have expected the respondents in the study to use e-mail to communicate with their students on a regular basis, particularly as Internet computers are available to the students in the library, departmental and faculty computer laboratories. This would also have enhanced the use of Internet facilities by the students. They were perhaps not prepared to go through the rigour of collecting the e-mail addresses of their students.

Of the 93 (43.1%) respondents who used the Internet 'frequently' to gather general teaching materials, 81 (87.1%) claimed to have Internet access competence. The same association between regular use of Internet and Internet access competence was observed among those who used the Internet to gather empirical materials for teaching, course description presentation and referral for additional lecture materials. The findings really show the need for a formal training in Internet use.

Perceived Usefulness on Research and Teaching

Many of the respondents affirmed the importance of the Internet in research and teaching. Of the 150 (69.4%) respondents who found the Internet to be 'very useful' and 'useful' respectively for research, 123 (82%) had Internet access competence (table 9).

Table 9: Internet Competence and Extent of Usefulness of the Internet in Teaching and Research

Extent of internet Usefulness	In Research Effectiveness	Internet Access Competence	In Teaching Effectiveness	Internet Access Competence
Very Useful	75 (34.7%)	66 (30.6%)	39 (18.1%)	33 (15.3%)
Useful	75 (34.7%)	57 (26.4%)	66 (30.6%)	57 (26.4%)
Just Useful	63 (29.2%)	24 (11.1%)	48 (22.2%)	42 (19.4%)
Rarely Useful	12 (5.6%)	9 (4.2%)	33 (15.3%)	21 (9.7%)
Not Useful	12 (5.6%)	9 (4.2%)	18 (8.3%)	12 (5.6%)
No Response	6 (2.8%)	-	12 (5.6%)	-

However, the Internet was essentially used for literature searching as revealed in table 7. Indeed, the Internet offers researchers the opportunity to conduct library research given the growth of electronic journals. According to Zenger and Walker (<http://cssrvr.entnem.ufl.edu/~walker/fewww/ZengerARE.htm>), the Internet's greatest impact on research is on the migration to the web of journals and other specialised research literature. This is in addition to promoting collaborative research among scholars, as previously mentioned above.

Constraints to Effective Use of the Internet

When respondents were asked to indicate constraints to the effective use of the Internet resources, a large proportion mentioned *lack of time, lack of Internet searching skills and ignorance of the resources available on the Internet for teaching and research* (as listed in table 10).

Table 10: Constraints to Effective Use of the Internet

Constraint	Number of Respondents	Percentage of total respondents
Lack of Computer with Internet Access	15	6.9%
Lack of Personal Computer	18	8.3%
Lack of Time	66	30.6%
Lack of Searching Skills	66	30.6%
Ignorance of Resources	51	23.6%
Total	216	100%

However, we consider the lack of Internet searching skills (i.e. competence) by the respondents as a major contributory factor to the ignorance of Internet resources and lack of time. We believe that acquisition of Internet skills could lead to discovery of valuable research and teaching resources, which would then cause the users to make time for Internet searching to enhance their research and teaching. Internet access competence would be expected to stimulate regular use of the Internet and minimise the perceived barriers to Internet use.

Conclusion

The study showed that many of the respondents were skilled users of the Internet only as far as its application in research activities was concerned. They found it useful in the area of literature and supporting/baseline data searching. These respondents seemed not to be skilled in the use of the Internet to enhance teaching activities, possibly as a result of their limited skills or lack of motivation. A majority of those who claimed to be competent in Internet use had no prior formal training. The study therefore revealed that the respondents who claimed to be skilled in Internet use would still need further training in order to acquire essential skills, such as those required for using File Transfer Protocol, presenting course description on the Internet, using the Internet to deliver additional lecture notes, as well as using Internet mail to send files to students. This would enable them to fully reap the benefits of the Internet facilities in teaching and research. This study also reinforces the need for adequate formal training in Internet use in preparing

staff for the implementation of the e-Learning initiative of the University. Adequate formal training would also enable the university to achieve the objective for which all academic staff were provided with personal computers and given Internet access.

References

- IT Department, University of Botswana (2001) UB Student IT Facilities Update. Gaborone: University of Botswana.
- Lacey, Linda (1999) Using Web-Based Distance Education Tools to Promote Health Care Research in Developing Countries. *ALN Magazine*, 3(1) [online], available at: http://www.aln.org/alnweb/magazine/vol13_issue1/lacey.htm, Retrieved: 24th November 2001.
- Ojedokun, Ayoku A. (2001) Internet Access and Usage by Students of the University of Botswana. *African Journal of Library, Archives and Information Science*, 11 (2) 97-107.
- Preston, Geoff (1998) The Classroom of Tomorrow. *Interactive* 20: 36-37
- Russell, Ben (2000) Learning online "will replace the classroom." *Independent*, 16th June 2000, p. 11.
- University of Botswana (1996/97) Annual Report, pp. 49-50
- Zenger, J.T and T. J Walker (2001) Impact of the Internet on Entomology Teaching and Research, [online], Available at: <http://cssrvr.entnem.ufl.edu/~walker/fewwww/ZengerARE.htm>, Retrieved: 24th February 2001.

- * Ayoku A. Ojedokun is a librarian at the University of Botswana, Department of Library Services. He attended the University of Ibadan, Nigeria. He holds B.Sc., M.Inf.Sc.

Emmanuel O. Owolabi is Associate Professor in the Department of Physical Education, University of Botswana. He attended the University of Ibadan, Nigeria and Birmingham University, England. He holds B.Ed., M.Ed, PhD



EMMANUEL O. OWOLABI



AYOKU A. OJEDOKUN

A Comparative Analysis of the Characteristics of Authors in Four Nigerian Librarianship Journals

Rose B. Okiy

*Delta State University Library
Abraka, Nigeria*

Abstract

A comparative analysis of the characteristics of Nigerian authors of articles published in the African Journal of Library, Archives and Information Science (AJLAIS), the Nigerian Libraries (NL), Lagos Librarian (LL) and the Nigerian Library and Information Science Review (NLISR) between 1994 and 2000 was carried out. The analysis covered major topics written by the authors, gender of authors, geographical location of authors, type of employment, affiliating organisation, and form of authorship of the authors. The study revealed that Nigerian authors who published in the four journals displayed similar characteristics, despite the fact that AJLAIS is a reputable international journal while NL, LL, NLISR are local journals. Also, the findings revealed that male authors were predominant in all the journals and authors from the South-West zone of Nigeria constituted a significant majority in the four journals. Furthermore, a majority of the articles in all the journals were of single authorship. A classification of the authors by affiliating organisations showed that authors from the academic libraries were predominant in the four journals. Finally, information technology was revealed as the most researched topic by the authors.

Introduction

There are many librarianship journals established for the purpose of disseminating the results of research by scholars in the field. Like their counterparts in other professions, librarians use the forum of their professional journals to exchange ideas and experiences on professional practice with others in the profession. In this way, new knowledge and innovation in the profession are publicised. Furthermore, the journals serve as information sources for researchers on conferences, workshops and reviews of latest publications in their disciplines (Aina and Mabawonku, 1996).

This paper focuses on four librarianship journals published in Nigeria. They are the *African Journal of Library, Archives and Information Science* (AJLAIS), the *Nigerian Libraries* (NL), *Lagos Librarian* (LL) and the *Nigerian Library and Information Science Review* (NLISR). The articles published in the four journals

between 1994 and 2000 were analysed in order to carry out a comparative analysis of the characteristics of the authors. The four journals were selected because these were the librarianship journals published more regularly during the period covered by this study.

Background Information on the Four Journals

The AJLAIS was first published in April 1991. The main objective of the journal, according to Aina and Mabawonku (1996), is to provide on a regular and sustainable basis, an excellent scholarly journal that will provide a forum for librarians, documentalists, archivists and other information specialists, for reporting empirical research findings in the various disciplines of the information profession with emphasis on the African setting. Since its inception, it has been very regular, publishing articles in the librarianship, archives and information science profession from all over the African continent.

The *Nigerian Libraries* is the journal of the Nigerian Library Association. It was first published in 1964. Its major aim has been to facilitate the exchange of information on various aspects of the profession as well as the dissemination of results of recent research undertaken by its members on librarianship in Nigeria. The *Lagos Librarian* is the journal of the Lagos State chapter of the Nigerian Library Association. It publishes articles on various aspects of librarianship from members of the profession in and outside Lagos State. The *Lagos Librarian* started in September 1965 as *Information Bulletin* with the main aim of disseminating news to librarians. In March 1967, *Information Bulletin* gave way to the *Lagos Librarian* having been transformed into a full-fledged professional journal with the aim of publishing scholarly articles and results of research by members of the profession on various aspects of librarianship. Although the journal had the problem of irregularity within the first five years, it has managed to survive and get published regularly. The *Nigeria Library and Information Science Review* (NLISR) is the journal of the Oyo State chapter of the Nigerian Library Association. According to Momoh (1996), the journal serves as a forum for publishing the results of empirical research in the field of library and information science, especially those pertaining to Nigeria or Africa. It also entertains "articles of high quality" on the theoretical aspects of the discipline as well as book reviews, news items and other brief communications. The NLISR was first published in May 1983 and it has managed to survive over these years in spite of the harsh economic situation prevailing in the country.

Related Studies

The attention of writers has been focussed on the issue of authorship and their characteristics over the years. Olsgaard and Olsgaard (1980) carried out a study of five professional journals. The purpose of the study was to determine if the publication trend indicated a bias in sex, occupation and geographical location of

authors. The study revealed that male authors published more than female authors. Also, authors from the North-East and Mid-West regions of the United States predominant. Olanlokun (1983) examined the characteristics of authors in three library journals with international flavour. He examined characteristics, such as occupation, gender and geographical distribution of the authors and concluded that practising librarians, as well as male contributors, were predominant. Olanlokun (1988/90) also examined the characteristics of authors in the issues of the *Nigerian Libraries* between 1977 and 1985. The study revealed that the contributors from the Western zone of Nigeria was predominant and men accounted for over eighty percent of the publications. A further investigation conducted by Okiy (1997/98), on the trend of publishing in the *Nigerian Libraries* between 1985 and 1992 corroborated the findings of Olanlokun (1988-90), adding that library educators contributed significantly to the journal during this period. Other related studies include those by Ikizama (1982), Adegbule-Adesida (1987), Akhigbe (1984) and Mommoh (1997).

The prevailing mortality rate of librarianship journals in Nigeria, as lamented by Azubuike, Adeyemoye and Okojie (1990), Ifidon (1994) and Aina and Mabawonku (1996), makes it worthwhile to examine the librarianship journals which have managed to publish up-to-date in Nigeria to know if authors who publish in them share similar characteristics with authors who publish in highly rated international journals of librarianship.

Methodology

The data for this study were obtained from articles published in issues of *AJLAIS*, *NL*, *LL* and *NLISR* between 1994 and 2000. Each issue of the journal was thoroughly examined to obtain the following information:

- (a) Major topics covered by the issues
- (b) Gender of authors
- (c) The geographical distribution of authors
- (d) Type of employment of authors (practising librarians, library educators, others) of authors
- (e) Form of authorship (single or multiple)
- (f) Affiliating organisation of the authors

The extent of coverage of each of the areas mentioned above was determined numerically and reported in percentages. Only articles written by Nigerian authors in the four journals were covered. Therefore, articles published by non-Nigerian authors in *AJLAIS* were excluded.

Findings

Table 1 shows the issues of the four journals from 1994-2000. It revealed that *AJLAIS* published two issues per year throughout the period covered in the study

Nigerian Libraries published only one issue yearly from 1994-1997, while between 1998 and 2000, two issues of *Nigerian Libraries* were published yearly. The *Lagos Librarian* consistently maintained the publication of a single issue instead of two issues each year throughout the period of the study. The *NLISR* also combined issues of the journal throughout the period of the study. In fact for the years 1994/95 and 1997/98 four issues of the journals were combined into single issues as can be seen in table 1. This shows the level of delay and irregularity in publishing the journal.

Table 1: Distribution of Issues in the Four Journals

Year	AJLAIS			NL			LL			NLISR		
	Vol.	No	No of Issues	Vol.	No	No of Issues	Vol.	No	No of issues	Vol	No	No of Issues
1994	4	1&2	2	27/28	1-4	1	15	-	1	12	1&2	
1995	5	1&2	2	29	1&2	1	16	-	1	13	1&2	1
1996	6	1&2	2	30	1&2	1	17	1&2	1	14	1&2	1
1997	7	1&2	2	31	1&2	1	18	1&2	1	15	1&2	1
1998	8	1&2	2	32	1&2	2	19	1&2	1	16	1&2	
1999	9	1&2	2	33	1&2	2	20	1&2	1	17	1&2	1
2000	10	1&2	2	34	1&2	2	21	1&2	1	18	1&2	1

Table 2 shows the major topics covered by the four journals during the period analysed in this study. The topics are ranked according to how often each topic under consideration featured in each of the journals within this period. A total of ten topics featured prominently in most of the journals throughout the period as displayed in the table. Only topics which featured at least six times in at least two of the journals within the period are included in the ranking. Information technology ranked highest, featuring 32 times in all the journals while public and school libraries ranked lowest featuring 6 times in two of the journals.

These findings corroborate that of Alemna (2001) when he studied periodical literature in library and information science in Africa, reporting that information technology consistently remained at the top as the area most researched into. Other areas of study were general librarianship, academic libraries, bibliometrics, etc.

Table 3 shows the distribution of authors in the four journals by gender. An analysis of the authors by gender for the four journals revealed a preponderance of male authors. This finding in the *AJLAIS* was also prevalent in the other journals. This goes to buttress previous studies such as those of Olsgaard and Olsgaard (1980), Olanlokun (1988/90) and Okiy (1997/98) that male authors dominated in the librarianship journals which they studied. It is interesting to note an exception to this in the 1994-1995 issue of the *NLISR* where female authors dominated.

Table 2: Ranked List of Major Topics Covered by the Four Journals

Rank	Topic	AJLAIS	NL	LL	NLISR	Total
1.	Information Technology	8	6	8	10	32
2.	General Librarianship	5	9	6	7	27
3.	Academic Libraries	1	3	7	7	18
4.	Bibliometrics	1	3	2	9	15
5.	Library Administration	1	5	4	2	12
6.	Records Management	4	1	7	-	12
7.	Library Personnel	1	2	6	2	11
8.	Library Use	-	3	8	-	11
9.	School Libraries	-	4	-	2	6
10.	Public Libraries	-	4	-	2	6

Table 3: Distribution of Authors by Gender

Journal	Male		Female	
	No.	%	No.	%
AJLAIS	38	84.4	7	15.6
NL	56	71.8	22	28.2
LL	55	85.9	9	14.0
NLISR	37	67.3	18	32.7

Table 4 shows the distribution of geographical location of authors of *AJLAIS*, *NL*, *LL* and *NLISR* according to the geographical zones in Nigeria. The geographical zones are: North-Central (NC), North-East (NE), North-West (NW), South-East (SE), South-South (SS) and South-West (SW). The data show a trend in which a majority of the authors were from the South-West zone in all the four journals surveyed. This trend was also reported by Mommoh (1996; 1997) that authors who published in *Lagos Librarian* and *NLISR* respectively were mainly from the Western zone. Only *AJLAIS* out of the four journals covered all the geographical zones. The reason for this could be linked to the fact that *AJLAIS* is the most widely distributed LIS journal in Nigeria; thus, it is well known in all the zones of Nigeria. Another reason could be that it is regularly published.

A general overview of the contributions of authors in the four journals according to their occupations reveals that practising librarians contributed most of the articles. This trend is remarkable especially because the same pattern of publishing is recorded for Nigerian authors in *AJLAIS*, which is an international journal, as well as the other three journals. This goes to corroborate the findings of Olanlokun (1988/90) and

Table 4: Distribution of Authors by Geographical Zones

Journal	NC		NE		NW		SE		SS		SW	
	No	%	No.	%	No.	%	No.	%	No.	%	No.	%
AJLAIS	3	6.7	1	2.2	3	6.7	10	22.2	2	4.4	26	57.8
NL	5	6.5	-	-	2	2.6	10	12.9	8	10.3	52	67.5
LL	4	6.3	-	-	5	7.8	4	6.3	8	12.5	43	67.1
NLISR	1	1.8	-	-	-	-	2	3.6	8	14.5	44	80

Table 5: Distribution of Authorship According to Occupation

Journal	Practising Librarians		Library Educators		Others	
	No.	%	No.	%	No.	%
AJLAIS	36	80	9	20	-	-
NL	63	80.8	12	15.4	3	3.8
LL	55	85.9	9	14.1	-	-
NLISR	48	87.3	7	14.1	-	-

Okiy (1997/98) who found that practising librarians published more in librarianship journals than library educators. The fact that practising librarians are expected to publish or perish like their counterparts who are library educators may have accounted for this development. Furthermore, the practising librarians are more in number than the library educators in the profession in Nigeria. It is therefore not surprising that in all the journals surveyed, practising librarians contributed more than library educators. However, it is significant to note that *AJLAIS* had the highest proportion of articles from library school educators among the four journals.

Table 6: Distribution of Authors According to Form of Authorship

Journal	No of Articles	No of single Authors	%	No of Multiple Authors	%
AJLAIS	45	28	62.2	17	37.8
NL	78	67	85.9	11	14.1
LL	64	58	90.6	6	9.4
NLISR	55	42	76.4	13	23.6
TOTAL	242	195	80.6	47	19.4

The study also sought to find out the form of authorship (single or multiple) of the articles in the four journals. From the results in table 6, it appears that authors prefer to write articles individually. AJLAIS recorded the highest proportion of multiple authorship. For the other three journals, multiple authorship was low. However, the small number of multiple authorship in the four journals may be due to the fact that single authorship is more fulfilling and also because works of single authorship tend to attract higher rating during assessment for promotion in Nigerian universities. This preference for single authorship was also revealed in a study by Mommoh (1997).

Table 7 shows the affiliating organisations of the authors in the four journals during the period covered by this study. The table reveals that the majority of the authors were from academic libraries. On the other hand, there was no author from school libraries throughout the period of the study.

Table 7: Distribution of Authors According to Type of Organisation

Type of Organisation	AJLAIS	NL	LL	NLISR	TOTAL	%
Academic Libraries	31	44	47	39	161	65.5
Library School	7	15	2	7	31	12.6
Special Libraries	5	4	7	5	21	8.5
Research Libraries	2	11	3	3	19	7.7
Public Libraries	-	7	2	-	9	3.7
Archives	-	2	2	-	4	1.6
National Libraries	-	-	-	1	1	0.4
School Libraries	-	-	-	-	-	-
Total	45	83	63	55	246	100.0

The results reveal that authors from academic and research libraries were more prolific than those from other organisations. This may be due to the fact that publications are essential for the upward mobility of authors in academic libraries and library schools due to the nature of these organisations which emphasise research and publication as prerequisites for career advancement. As for the authors in special and research libraries, research and publications are encouraged only for the advancement of knowledge.

Conclusion and Recommendations

A comparative analysis of the characteristics of the authors of articles published in AJLAIS, NL, LL, and NLISR between 1994 and 2000 revealed that women were under-represented in authorship in the four professional journals studied. The classification of authors in the journals according to geographical zones showed that Nigerian authors from the South-West zone of Nigeria were in majority in all the four journals studied. The study also revealed that information technology was the most

researched topic. The occupational classification of the authors in the four journals showed that practising librarians were the major contributors of librarianship literature in Nigeria. A classification of authors with regard to their affiliating organisation showed that a larger percentage of authors were from academic libraries. A majority of the authors in all the four journals had a preference for single authorship as against joint authorship.

It is recommended that

- The journals should endeavour to have adequate representation of authors in all the six geographical zones in Nigeria. Therefore, the *Nigerian Libraries*, *Lagos Librarian* and the *NLISR* should make deliberate effort to source for articles from all the zones in Nigeria in order to give their journals a wide coverage. This can be done through sending out call for papers for the journals during conferences, workshops, etc.
- The journals should ensure that they are regularly published. A situation in which only single issue of *Lagos librarian* was published each year throughout the period of the study and several issues of the *NLISR* were combined during this period should be improved as this is an aberration that should not be allowed to continue.

References

- Adegbule-Adesida, E.K. (1987) Characteristics of Literature of Agricultural Research in Nigeria. *Nigerian Library and Information Science Review*, 5 (1 and 2) 25 - 37.
- Aina, L.O. and Mabawonku, I.M. (1996) Management of Scholarly Journals in Africa: A Success Story. *African Journal of Library, Archives and Information Science*, 6 (2) 63 - 84.
- Akhighbe, Funmi O. (1984) Some Characteristics of the Literature of Agricultural Research in Nigeria. *Nigerian Library and Information Science Review*, 5 (1 and 2) 25- 37.
- Alemna, A.A. (2001) The Periodical Literature and Information in Africa, 1996 - 2000. *Information Development*, 17 (4) 257- 260.
- Azubuikwe, A.A. Adeyomoye, J.T. and Okojie V.O. (1990) Mortality Rates and Other Characteristics of Nigerian Scientific Journals. *Paper Presented at the 4th Conference and General Assembly of the African Association of Editors*, Ibadan. IITA 14 p.
- Ifidon, S.E. (1994) Overview of the State of Nigerian Journal Publishing. In: *Michael Wise (ed.) Survival under Adverse Condition: Proceedings of the African Library Science Workshop*. The Hague: IFLA, pp. 19-26.

- Ikhizama, B. O (1982) The Development of Maize Literature in Nigeria. *Quarterly Bulletin of the International Association of Agriculture Libraries and Documentation*, 27 (4) 122- 28.
- Mommoh, O. M. (1996) Analytical Study of Nigeria Library and Information Science Review, 1983-93. *Nigeria Library and Information Science Review*, 14 (1 and 2) 1-8.
- Mommoh, O. M. (1997) Content Analysis of Articles in Lagos Librarian 1967- 1995. *Lagos Librarian*, 18 (1 &2) 49-55.
- Okiy, Rose B. (1997/8) Publication Output in Nigerian Libraries, 1985-1992. *Nigerian Library and Information Science Review*, 15 &16 (1 ad 2) 31- 35.
- Olanlokun, S.O. (1983) Characteristics of Authors in Three Library Journals. *Nigerian Libraries*, 19 (1-3) 49- 54.
- Olanlokun, S.O. (1988/90) Authorship in Nigerian Libraries 1977-1985. *Nigerian Libraries*, 24 (1 and 2) 22- 27.
- Olsgaard, John N. and Olsgaard, Jane K. (1980) Authorship in Five Library Periodicals. *College and Research Libraries*, 41(1) 49-53.

* Mrs. Rose B. Okiy is a principal librarian at the Delta State University Abraka, Delta State, Nigeria. She attended the Universities of Benin and Ibadan, Nigeria. She holds B.Ed (Hons) History and MLS. She is currently a doctoral student in the Department of Library, Archival and Information Studies, University of Ibadan, Nigeria.



ROSE B. OKIY

Challenges of Developing a Taxonomic Information System (TAXIS) on the Indigenous Medicinal Plants of South-Western Nigeria

O. O. Adelowo

*Department of Pure and Applied Biology
Ladoke Akintola University of Technology
P.M.B. 4000, Ogbomoso, Nigeria*

and

R. O. Agbonlahor

*Africa Regional Centre for Information Science (ARCIS)
University of Ibadan,
P.O. Box 22133
Ibadan, Nigeria.
Ragbonlahor@yahoo.com*

Abstract

The oral nature of indigenous knowledge has always been cited as one of the important problems limiting its documentation, development and utilisation. This was found to be true in the development of a taxonomic information system (TAXIS) on medicinal plants. Information was collected about the taxonomy, important uses and dangers associated with the use/misuse of 118 medicinal plant species indigenous to South-Western Nigeria. Photographs of 21 of the 118 species were collected as well as bibliographic data on 158 publications that discussed the various plant species. This information was used to develop a taxonomic information system (TAXIS) on medicinal plants. Some problems were encountered in the process of developing TAXIS. These include the unwillingness of those involved with indigenous medicinal plants to volunteer information, a mass of unsubstantiated information, variation in names of some species and lack of coordinated effort by the government and the scientific community to develop and standardise products from these plants.

Introduction

Ethnobotanical research plays a crucial role in documenting the traditional health care practices of many countries of the world (Balick and Cox, 1997). Therefore, a number of developing nations, including China, Mexico, Thailand and Nigeria, have decided to integrate traditional medicine into their primary health care system. This

integration is hinged on the vast resource and potentials of the tropical rain forest as a source of cheap and valuable drugs for the people.

In the estimate of the World Health Organisation (WHO, 1997), medicinal plants form the basis of the traditional or indigenous health care system used by about 80% of the population of most developing countries who rely on traditional medicines for their health care needs. Modern pharmacopoeia still contain at least 25% drugs derived from plants and many others which are synthetic analogues built on prototype compounds isolated from plants (De Silva, 1997).

Unfortunately, the paucity of technical information is a serious constraint to developing the potentials of medicinal plants as sources of cheap drugs (De Silva, 1997). Most of the information and knowledge about these plants are resident in the brains of traditional medical practitioners who pass such knowledge on to only trusted aides or relations when they are dying (Mchombu, 1993). This lack of documentation has made much useful information to be diluted, reduced in detail, or completely lost. While there are attempts to document some information about medicinal plants in textual form, the same cannot be said of the electronic form of this important form of indigenous knowledge (Bhat, 1995; 1997).

There are many advantages of electronic information storage and retrieval over manual forms. One of this is ease of retrieval. Hence, the development of a computerised user-friendly information storage and retrieval system would be valuable in satisfying the great demand for information on traditional uses of medicinal plants. It will also aid their proper identification and facilitate the organisation of information being generated (van Seters, 1997). Indeed, such a system could be placed on an Internet site or CD-ROM. In addition, it would be of valuable assistance to developing countries in research and development work on the industrial utilisation of local plant resources.

However, the production of local databases containing indigenous knowledge to address local needs is plagued by several constraints, the most important of which is the tacit and oral nature of indigenous knowledge. This oral nature has made this type of knowledge to take on the status of secret/private knowledge (Sturges, Mchombu and Neil, 1991; Mchombu, 1993). Other constraints have been the ferocious attack on this body of knowledge. This denigration was started by former colonial governments and it is still being continued by the African elite in the form of negative attitudes towards traditional practitioners, local researchers and other pragmatic sources of indigenous information (Sturges, Mchombu and Neil, 1991; Nagy, 1991). There are still problems of inadequate data collection procedures, poor statistical base and a general paucity of information in African countries. Also, efforts to generate local information are largely uncoordinated, under-funded and isolated (Sturges, Mchombu and Neil, 1991; Nagy, 1991). This has done much to reduce the importance of

indigenous knowledge, which has resulted in little attention given to the valuable lessons contained in them.

While there have been several reports about creation of databases of indigenous information, those that specifically focus on medicinal plants of Nigeria are rare. Yet the value of an information system like TAXIS in pharmaceutical research and development, as well as in the conservation of indigenous plant species cannot be over-emphasised.

This paper discusses the procedure for developing TAXIS, a taxonomic database of the indigenous medicinal plants of South-Western Nigeria.

User Needs Survey

A database can be developed to solve a particular problem or to provide general information (Fidel, 1987). TAXIS was developed with both objectives in mind. A user needs survey was carried out in 2001 among sixty potential users of the database using the oral interview technique. The users were selected purposively from research institutions and universities in Nigeria using the following criteria:

- (i) Scientists involved in medicinal plant research who might consult the information system for information relevant to their research interests. These scientists were selected from the Department of Pure and Applied Biology, Ladoke Akintola University of Technology, Ogbomoso, Forestry Research Institute of Nigeria (FRIN), Ibadan, the International Institute of Tropical Agriculture, Ibadan, the College of Medicine, University of Ibadan and the Faculty of Agriculture and Forestry, University of Ibadan. Twenty scientists were interviewed.
- (ii) Other individuals who might consult the information system for general information or purposes of personal therapy. These included university students (postgraduate and undergraduate), lecturers, administrators, researchers and other scientists randomly selected from the institutions mentioned above. Forty people were randomly selected and interviewed.

The scientists interviewed expressed the need for an information system such as TAXIS to provide information about the taxonomic classification of the plant species, important uses and photographs of the species, and provide references to past research on the species. Surprisingly, none of the scientists requested for information on the complications that may result from the usage or abuse of products from these plant species.

Individual users, on the other hand, expressed need for information about the local and English names of the plant species, their medicinal value and how they are actually used or administered. Some also required the photographs of the species for easy identification.

Apart from these expressed needs, information about the taxonomic classification of the plants was reduced to the specific generic and family name of the species instead of including the entire taxonomic hierarchy. This is to ensure that there is no information overload. Personal communication with researchers at FRIN further strengthened this decision.

Data Collection

The local names of indigenous plant species with medicinal properties were collected through personal communication with traditional medical practitioners and community elders in the Oyo/Ogbomoso axis of South-Western Nigeria. The scientific names of these plant species were cross-checked at the Department of Pure and Applied Biology, Ladoké Akintola University of Technology, Ogbomoso. Further verification was done through personal contacts with scientists at the Forestry Research Institute of Nigeria (FRIN), Ibadan, Nigeria and through literature search in the institute's library. Efforts were also made to get independent scientific researchers in the field to verify the medicinal properties of these plants. These efforts were however largely unsuccessful as many of the scientists contacted were unwilling to volunteer such information.

From the many claims of the local contacts, the names of 118 species of plants with medicinal properties that were further confirmed at the sources mentioned earlier and through published literature were collected for input into the information system. Some plants mentioned in the literature as having medicinal properties, but not mentioned by the local contacts, were also included in the information system. A list of the medicinal plants is provided in the appendix.

Photographs of 21 of the 118 species stored in the database were obtained and digitised using a scanner. These were stored in a separate table in the database of the system. As part of the data collection exercise, 158 bibliographic references about the plant species in the information system were also collected and stored in another table in the database. Attempts were made to collect mainly literature that reported research results about the plants in TAXIS. Efforts were made to ensure that such literature were authored by Nigerians or had input from Nigerians in order to reflect what had already been done in Nigeria. However, some of the literature that were not authored by Nigerians but considered of general interest to medicinal plants researchers were also stored in the database.

System Design and Implementation

From the needs expressed by the proposed target users, TAXIS was designed to contain four database tables as follows:

- [i] **MEDIPLANT**: which contains information about the general uses of the plant species and contraindication that may result from their use.

SERIAL_NO	
biblio_no	29
bot_name	Colocynthis vulgaris
uses	Antiproliferative
contra	Unknown

Record: 34 4 91 of 118

Fig 1: MEDIPLANT data entry form

- [ii] **TAXINFO**: contains information on the taxonomic classification of the plant species stored in the database - their specific, generic and family names as well as their names in English and four major Nigerian languages (Yoruba, Igbo, Hausa and Edo) where available (Fig 2).

SERIAL_NO	
biblio_no	29
bot_name	Colocynthis vulgaris
eng_name	Melon
loc_names	Yoruba: egusi, Igbo: bisi, Hausa: kuka, Edo: kuka
family name	
notes	

Record: 34 4 91 of 118

Fig 2: TAXINFO data entry form

BIBLIO

biblio_no

authors: Abasiu, A.M. and Oroniwo, U.M

year: 1993

title: Antiproteolytic activity of Melon Seed (Egusi) Products (Citrullis vulgaris)

journal: Bioscience Research Communications, Vol.5

pages: 27 - 31

Record: 14 of 156

Fig 3: BIBLIO data entry form

- (iii) **BIBLIO:** this table contains 158 publications of past research works on the plants selected from journals and books and some publications that may be of general interest to users of the information system (Figs 3).

- (iv) **ALBUM:** contains photographs of 21 of the 118 species stored in the database (Fig 4).

ALBUM

Botanical Name: Citrullis vulgaris

Photograph

Record: 11 of 21

Fig 4: ALBUM data entry form

All four tables as well as the entire information system were created using the Windows-based MS Access- a relational database management system. The choice of MS Access was informed by the fact that it is widely available on the Microsoft

office suite of programs, can run on any computer system running on Windows 97 or later versions, and allows for easy creation, management and querying of databases.

Interface Design

A welcome interface was designed for TAXIS using MS Access. From the interface, users can click on buttons to link them directly to the data entry or report module. The aim was to develop a user-friendly information system that users with little knowledge of it can interact with.

Fig 5: TAXIS welcome page

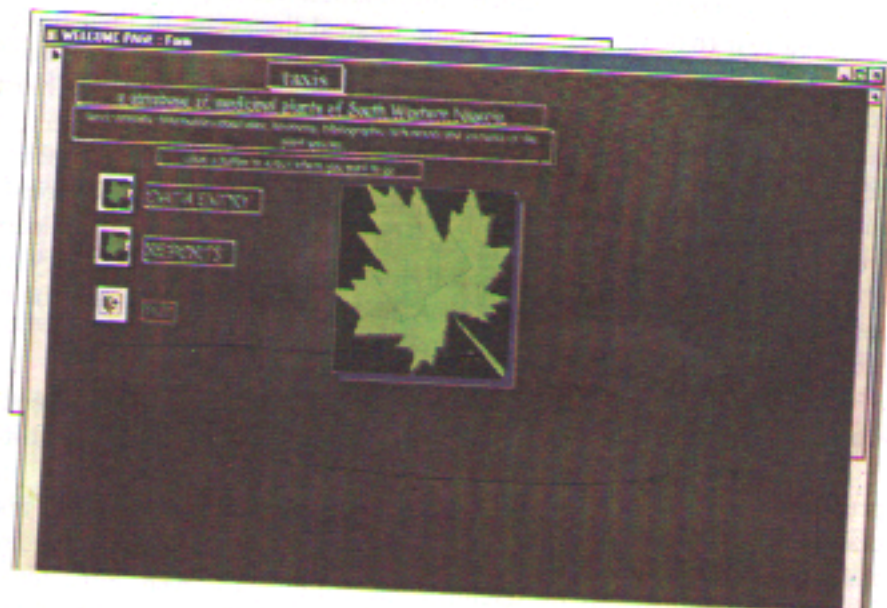
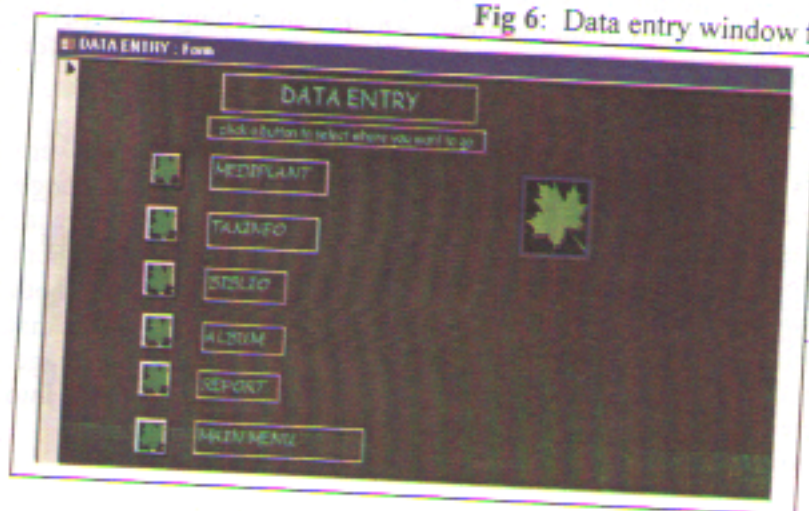


Fig 6: Data entry window for TAXIS.



Discussion

Information about plants used in traditional medical practice is mostly resident in the brains of selected members of the community. Hence, knowledge gained from their use is not immediately available to government, researchers, administrators and individuals even if they wish to take advantage of such knowledge (Sturges, Mchombu and Neil, 1991).

The oral nature of the type of information targeted for storage in TAXIS posed some challenges during the process of developing the system. The most serious challenge was the unwillingness of a few local practitioners and most of the scientific researchers contacted to volunteer information for input into the database. They expressed fear that we had either come to steal the secret of their trade or we could make their knowledge public and thereby cause them to lose business. This attitude buttressed the findings of Mchombu (1993) who reported that most indigenous knowledge, especially those concerned with healing and midwifery, were closely guarded secrets often inherited by close relations or direct descendants of the traditional medical practitioners. Surprisingly, on the whole, the local practitioners were more forthcoming when approached for information than the learned scientists who most of the time refused requests for interviews or were very vague in their contributions. This group claimed that they were not ready to make the results of their personal work available on a database that will be accessed freely.

Another challenge arose from the fact that very little effort had been made by the Nigerian government to scientifically validate the claims of traditional medical practitioners. Accordingly, the researchers encountered a lot of unsubstantiated claims about the medicinal efficacy of several plant species. It is also unfortunate that some plants claimed by practitioners to have medicinal properties were implicated as poisonous by scientific literature. These were either dropped from the information system or some information were supplied about the contraindications of such plants in the Mediplant table of the database. Another disturbing issue is the fact that most of the scientists interviewed in the user-needs survey did not request for information on the problems associated with the use of these plant species.

Owing to the dynamic nature of the science of taxonomy, some plant species were encountered whose names had changed over the years. An example is *plumbago zeylanica* now known as *vignia multinervis*. Some species were also encountered with the same local name for different species, e.g. *cassia alata* and *cassia podocarpa* both referred to as 'asunwon' and *borreria verticillata* and *mitracarpus scarab*, both referred to as 'irawo-ile' in Yoruba language (Gbile, 1984). We also discovered that some plants are given different local names in different dialects of the same language. Careful attempts were made to sort out and cross-validate these before input into TAXIS in order to avoid duplication.

Getting photographs of live plants to facilitate easy identification in response to the needs of target users posed a very serious challenge to the task of developing TAXIS. Some visits to the forest herbarium of FRIN yielded little results as the herbarium only maintains preserved species that cannot serve the purpose of identification effectively as most of the morphological features used for identification would have been negatively affected by the preservatives and the preservation methods used. The researchers were informed that the collection of such photographs would entail going into the forest where species could be identified and their photographs taken. Efforts in this direction were very tasking. The researchers were only able to successfully identify and photograph 21 out of the 118 species of plants stored in TAXIS.

Conclusion and Recommendations

Our experience with TAXIS has shown that it is possible to design an information system to capture complex biological information and automate this to generate useful output that will meet the need of interested users. TAXIS can serve as a model for the development of similar systems for researchers and users in other fields of science and technology. More importantly, such systems can aid medicinal plant research and conservation programmes especially if the scope of the project is expanded to cover the remaining regions of the country.

We would advise that designers of databases on indigenous information systems should set up a team involving at least one specialist on the specific subject area in order to ensure the development and design of systems that contain information that could satisfy the information needs of potential users.

The TAXIS database has been stored on CD-ROM and available from the authors. It currently cannot run in a networked environment. However, interactions with researchers have shown that systems which can run in networked environments, preferably on the Internet, are more desirable.

References

- Balick, M. and Cox, P.A. (1997) Ethnobotanical Research and Traditional Health Care in Developing Countries. In: *Medicinal Plants for Forest Conservation and Health Care*. Geneva: FAO/Gifts, pp. 12 - 23.
- Bhat, K.K.S. (1995) Literature Published During the Past Two Decades on Medicinal, Aromatic and Other Related Group of Plants. *Acta Horticulturae*, 390: 11- 17.
- Bhat, K.K.S. (1997) Medicinal Plants Information Databases. In: *Medicinal Plants for Forest Conservation and Health Care*. Geneva: FAO/Gifts, pp. 60 - 77.
- De Silva, T. (1997) Industrial Utilisation of Medicinal Plants in Developing Countries In: *Medicinal Plants for Forest Conservation and Health Care*. Geneva: FAO/Gifts, pp. 34 - 44.

- Fidel, R. (1997) *Database Design for Information Retrieval: A Conceptual Approach*. New York: John Wiley Publishers, 232 p.
- Gbile, Z.O. (1984) *Vernacular Names of Nigerian Plants: Yoruba*. Ibadan, Nigeria: FRIN, 101 p.
- Maja, N. (2001) Indigenous Knowledge and HIV/AIDS: Ghana and Zambia *IK Notes*, No. 30.
- Mchombu, K. J. (1993) *Information Seeking Patterns for Rural People Development in Africa*. Gaborone: Department of Library and Information Studies, 185 p.
- Nagy, K.H. (1991) The Information Technology Revolution and Economic Development. *World Bank Discussion Papers*, 120.
- Sturges, P., Mchombu, K. and Neil, R. (1991) The Indigenous Knowledge Base in African Development. *Social Intelligence*, 1: 213 - 237.
- Van Seters, A.P (1997) Forest Based Medicine in Traditional and Cosmopolitan Health Care. In: *Medicinal Plants for Forest Conservation and Health Care*. Geneva: FAO/Gifts, pp. 5 - 11.
- World Health Organisation (1997) *Medicinal Plants For Forest Conservation and Health Care*. Geneva: FAO/Gifts.

* O.O. Adelowo is a lecturer in the Department of Pure and Applied Biology, Ladok Akintola University of Technology, Ogbomoso, Nigeria. He attended Ladok Akintola University, Ogbomoso and Universities of Lagos and Ibadan. He holds B.Sc, MSc. (Microbiology) and M.Inf.Sc. degrees.

R.O Agbonlahor is a lecturer at the Africa Regional Centre for Information Science (ARCIS), University of Ibadan, Ibadan, Nigeria. She attended the University of Ibadan, Nigeria. She holds M.Inf.Sc degree.



O. O. ADELOWO



R. O. AGBONLAHOR

Appendix: List of Medicinal Plants Stored in TAXIS

S/N	Botanical Name	English Name	Local Names	Family Name
1	Vernonia Cinerea	-	Yor: Bojure	Compositae
2	Nicotiana Tabacum	-	Yor: Taba, Hau: Achara, Igb: Ufu, Ben: Ebo-Itaba	Solanaceae
3	Ocimum Gratissimum	Fever Plant	Yor: Efinrin, Igb: Nchu - Anwu	Lamiaceae
4	Securidaca Longipedunculata	-	Yor: Egbo Ipeta, Hau: Huwar Magunguna	Polygalaceae
5	Emilia Sagitata	-	Yor: Odundun, Igb: Nti - Ele	Asteraceae
6	Zingiber Officinale	-	Yor: Ata Ile Pupa, Hau: Chittar Aho	Zingiberaceae
7	Clausena Anisata	-	Yor: Atapari Obuko	Rutaceae
8	Cassia Podocarpa	-	Yor: Asunwon, Igb: Ogala	Caesalpiniaceae
9	Dalbergiella Welwitschii	-	Yor: Egbo Paran	Papilionaceae
10	Picralima Umbellata	-	Yor: Epo Arin Ben: Osu	Apocynaceae
11	Lawsonia Inermis	-	Yor: Laali	Lythraceae
12	Acanthospermum Hispidum	Star Burr	Yor: Dangunro	Compositae
13	Abrus Pectoralis	-	Yor: Oju Ologbo, Hau: Idon Zakara, Igb: Ainya-Nwono	Papilionaceae
14	Ficus Elegans	-	Yor: Asoro Funfun	Moraceae
15	Mormodica Balsamica	Balsam Apple	Yor: Ejirin Weere, Hau: Garafuni, Igb: Akban Ndene	Curcubitaceae
16	Tetracarpidum Conophorum	-	Yor: Awusa, Igb: Akan Otoli, Ben: Okhue	Euphorbiaceae
17	Holarrhena Wulfsbergii	False Rubber Tree	Yor: Ire, Hau: Barkin Mutum, Igb: Mba	Apocynaceae
18	Elytraria Acaulis	-	Yor: Ewe Esho, Igb: Achulu Nta	Acanthaceae
19	Cassia Occidentalis	-	Yor: Leere, Hau: Rai' Dore, Igb: Akedi Agbara	Caesalpiniaceae
20	Xylopi Aethiopica	-	Yor: Eeru, Hau: Kimba, Igb: Uda	Anonaceae
21	Piper Guineense	Bush Pepper	Yor: Iyere, Igb: Uziza	Piperaceae
22	Uvaria Chamae	-	Yor: Eruju, Ben: Akosa	Anonaceae
23	Vignia Multinervis	-	Yor: Inabiri, Igb: Onayoko/Oaya Aku	Plumbaginaceae
24	Cussonia Nigerica	-	Yor: Sigo, Hau: Gwabsa	Araliaceae
25	Uvaria Afzelii	-	Yor: Awogba, Ben: Akosa	Anonaceae
26	Anogeissus Leocarpus	-	Yor: Ayin, Hau: Marike, Igb: Atara/Abakaliki	Combretaceae
27	Jatropha Curcas	-	Yor: Lapalapa	Euphorbiaceae
28	Aframomum Latifolium	-	Yor: Oburo	Zingiberaceae
29	Xylopi Quintassii	-	Yor: Opalufon, Ben: Aghako	Anonaceae

S/N	Botanical Name	English Name	Local Names	Family Name
30	Citrus Lemonum	-	Yor:Orombo	Rutaceae
31	Aframomum Melegueta	-	Yor:Atare, Hau:Chitta, Igb:Opolo/Ose	Zingiberaceae
32	Borassus Aethioun	-	Yor:Agbon Onidu/Agbon Mihoho, Hau:Giginya, Igb:Ubiri/Ubulu	Palmae
33	Brassica Oleracea	Cabbage	-	Cruciferae
34	Alstonia Boonei	Alstonia	Yor:Wawon/Ahun, Igb:Egbu, Ben:Ukhu	Apocynaceae
35	Mangifera Indica	Mango	Yor:Mangoro	Anacardiaceae
36	Alternanthera Pungens	-	Yor:Dagunro	Amaranthaceae
37	Carica Papaya	Pawpaw	Yor:Ibepe, Hau:Gwandu, Igb:Okworo- Beke	Caricaceae
38	Aloe Vera	-	-	Liliaceae
39	Borreria Filiformis	Bottle Weed	Yor:Oko-Ire	Rubiaceae
40	Vinca Rosca	-	-	
41	Cassia Alata	-	Yor:Asunwon, Igb:Okpo	Caesalpiniaceae
42	Vitellaria Paradoxa	Shea-Butter Tree	Yor:Emi, Hau:Kadanya, Igb:Osisi	Sapotaceae
43	Morinda Lucida	-	Yor:Oruwo	Rubiaceae
44	Euphorbia Lateriflora	-	Yor:Enu-Opiye	Euphorbiaceae
45	Acalypha Wilkesiana	Red Acalypha	-	Euphorbiaceae
46	Anchomanes Difformis	-	Yor:Ogiri Sako	Araceae
47	Strophantus Hispidis	-	Yor:Isa Gere, Hau:Kwankwanitantsuja	Apocynaceae
48	Secamone Afzeli	-	Yor:Ailu	Asclepiadaceae
49	Hyptis Suaveolens	-	Yor:Arunfofo	Lamiaceae
50	Blighia Sapida	-	Yor:Ishin, Hau:Gwanj Kusa, Igb:Okpu, Ben:Ukpe	
51	Borreria Verticillata	-	Yor:Irawo Ile	Rubiaceae
52	Zanthoxylum Gilletii	-	Yor:Ata	
53	Zanthoxylum Rigidifolium	-	As Above	
54	Zanthoxylum Leprieurii	-	As Above	
55	Euphorbia Kamaerunica	-	-	
56	Mitracarpus Scarba	-	Yor:Irawo Ile	
57	Acalypha Torta	-	-	Euphorbiaceae
58	Ceiba Pentandra	Silk Cotton	Yor:Araba, Hau:Rimi, Igb:Akpu	Bombacaceae
59	Discoglypema Cabneur	-	Yor:Akika-Agba	Euphorbiaceae
60	Garcinia Kola	Bitter Kola	Yor:Orogbo, Igb:Adii Akuruma, Ben:Edun	Guttiferae
61	Acacia Polycantha	-	-	Mimosaceae
62	Portulaca Oleracea	-	Yor:Papasan	Portulacaceae

S/N	Botanical Name	English Name	Local Names	Family Name
63	<i>Annona Senegalensis</i>	-	Yor: Ibobo, Hau: Gwandardaji, Igb: Uburu-Ocha	Anonaceae
64	<i>Calotropis Procera</i>	-	Yor: Bomubomu, Hau: Tumfafiya, Ful: Bambambi	Asclepiadaceae
65	<i>Kigelia Africana</i>	-	Yor: Pandoro, Hau: Rahaina, Igb: Izhi, Ben: Ubon gbon	Bignoniaceae
66	<i>Adansonia Digitata</i>	Baobab	Yor: Ose	Bombacaceae
67	<i>Telfairia Occidentalis</i>	-	Yor: Egusi Iroko, Igb: Ahu/Ogo	Cucurbitaceae
68	<i>Cucumeropsis Manii</i>	-	Yor: Egusi Itoo	Cucurbitaceae
69	<i>Cucumis Melo</i>	-	Yor: Ewe Ina	Cucurbitaceae
70	<i>Khaya Senegalensis</i>	Mahogany	Yor: Oganwo	Meliaceae
71	<i>Catharanthus Roseus</i>	-	-	-
72	<i>Chromolaena Odoratum</i>	-	Yor: Ewe Akintola	-
73	<i>Moringa Oleifera</i>	Horse Radish	Yor: Ewe Ile, Hau: Zogal, Igb: Ikwe Oyibo/Okwe-Beke, Ful: Gawara	Moringaceae
74	<i>Stychnos Spp</i>	-	Yor: Atako	Longaniaceae
75	<i>Oldelandia Corymbosa</i>	-	Yor: Oyigi, Hau: Ratsa Hanji, Igb: Ulimbe	Rubiaceae
76	<i>Oldelandia Affinis</i>	-	As Above	Rubiaceae
77	<i>Tiliacora Dinklagei</i>	-	-	Menispermaceae
78	<i>Tiliacora Funifera</i>	-	-	As Above
79	<i>Solanum Torvum</i>	-	Yor: Igba Yanrin Elegun	Solanaceae
80	<i>Solanum Erianthum</i>	-	Yor: Ewuro Ijebu	As Above
81	<i>Dracaena Manii</i>	-	Yor: Peregun, Igb: Ukpo/Ikpo	Agavaceae
82	<i>Bridelia Ferruginea</i>	-	Yor: Ira, Hau: Kimi, Igb: Oha	Euphorbiaceae
83	<i>Colocynthis Vulgaris</i>	Melon	Yor: Egusi/Baara	-
84	<i>Capsicum Annum</i>	African Pepper	Yor: Ata Wewe, Hau: Barkono, Igb: Ose, Ben: Ehie	Solanaceae
85	<i>Chasmanthera Depeneds</i>	-	Yor: Ato	Menispermaceae
86	<i>Entandrophagma Utile</i>	African Cedar	Yor: Ijebo, Igb: Okeong, Ben: Gedulohor	Meliaceae
87	<i>Azadrachta Indica</i>	Neem Tree	Yor: Dongoyaro	Meliaceae
88	<i>Enantia Chlorantha</i>	African Yellow Wood	Yor: Iyani, Igb: Akanta, Ben: Akata/Ehranbabogo	Anonaceae
89	<i>Rauwolfia Vomitoria</i>	-	Yor: Oora Igbo	Apocynaceae
90	<i>Cymbopogon Citratus</i>	Lemon Grass	Yor: Koriko Oba, Igb: Akwukwo/Achara, Ben: Eti	Graminaeae
91	<i>Viscum Album</i>	-	-	-
92	<i>Spondias Mombin</i>	Yellow Spanish Plum	Yor: Iyeye, Hau: Tsadar Masar, Ben: Okhigan	Anacardiaceae
93	<i>Cnestis Ferruginea</i>	-	Yor: Esise/Ekoro, Igb: Amonketa, Ben: Ukpo	Connaraceae

S/N	Botanical Name	English Name	Local Names	Family Name
94	Vitex Doniana	-	Yor: Oori, Hau: Dinya, Igb: Ocha Koro	Verbenaceae
95	Vernonia Amygdalina	Bitter Leaf	Yor: Ewuro, Hau: Shiwaka, Igb: Onubu, Ben: Oriwo	Compositae
96	Treculia Africana	African Bread Fruit	Yor: Afon, Igb: Ukwu, Ben: Ize	Moraceae
97	Urtica Dioca	Stinging Nettle	Yor: Esisi/Ewe Ina	Urticaceae
98	Boerhaavia Diffusa	Hog Weed	Yor: Eemo/Etiponla, Hau: Babba Juji, Igb: Okpuruafe Elu	Nyctaginaceae
99	Ageratum Conyzoides	-	Yor: Imi-Eshu, Igb: Akwukwo-Nwosinaka	Compositae
100	Anacardium Occidentale	Cashew	Yor: Kaju	Anacardiaceae
101	Aspilia (Africana) Latifolia	-	Yor: Yunnyun, Hau: Tozalin Igb: Uranjila	Asteraceae
102	Bryophyllum Pinnatum	-	Yor: Abamodo	Crassulaceae
103	Costus Afer	-	Yor: Tete-Elegun, Hau: Kakizuwa, Igb: Opete	Zingiberaceae
104	Heliotropium Indicum	-	Yor: Agogo-Igun, Hau: Kalkashin-Korama	Boraginaceae
105	Morinda Longiflora	-	Yor: Oju-Ologbo	Rubiaceae
106	Sansevieria Liberica	African Bowstring Hemp	Yor: Oja-Ikoko, Hau: Moda, Igb: Ebube- Agu	Agavaceae
107	Hibiscus Sabdariffa	-	Yor: Isapa, Hau: Zo'barodo, Igb: Okworo- Ozo/Ojo	Malvaceae
108	Combretum Micranthum	-	Yor: Okan, Hau: Geza	Combretaceae
109	Combretum Glutinosum	-	As Above	Combretaceae
110	Crinum Spp.	-	Yor: Isumeri, Hau: Albasar Kwa'di, Igb: Ede- Chuku	
111	Erythrina Senegalensis	-	Yor: Ologbosere, Hau: Majiriya, Igb: Echichi, Be- n: Eranigbon Yakehi	Papilionaceae
112	Olax Gambecola	-	Yor: Ifon, Hau: Gwano Rafi, Igb: Atu- Ogili, Ben: Ukpakon	Olacaceae
113	Clerodendron Splendens	-	Yor: Opo-Esin/Adabi/Ora-Ojola, Igb: Afifa- Omya/Ufuchi	Verbenaceae
114	Tetrapleura Tetraptera	-	Yor: Aidan, Hau: Dawo, Igb: Ososhosho, Ben: Ighimiakhie	Mimosaceae
115	Ficus Exasperata	Sand Plant	Yor: Ipin	Moraceae
116	Fluerya Aestuans	-	Yor: Iperin, Ben: Oho-Ghogho	Urticaceae
117	Uraria Picta	-	Yor: Alupayida	
118	Biphia Nitida	-	Yor: Irosun	

Short Communication

Impact of Intervention Measures on Collection Development at Abubakar Tafawa Balewa University Library, Bauchi

Innocent Ekoja

Abubakar Tafawa Balewa University Library
PMB 0248
Bauchi, Nigeria

Abstract

This study was conducted to assess the impact of three intervention measures on collection development at Abubakar Tafawa Balewa University Library (ATBUL), Bauchi. The World Bank Federal Universities Development Sector Adjustment Credit was the best managed in conception and implementation, and has had the most impact. Under the scheme, ATBUL received 4756 volumes of books or 67.06% of total library acquisitions for the three years it lasted. The journals received under The World Bank Project accounted for 54.5%, 43.15% and 52.88% of total subscriptions for 1993, 1994 and 1995 respectively. The Petroleum (Special) Trust Fund National Educational Materials Procurement Programme was crudely executed even though it earned the Library 5082 volumes of books out of which only 1289 (25.36%) were processed. This was because some of the titles were supplied in hundreds of volumes which were not necessary under normal collection development exercise. The Educational Tax Fund allocation of ₦3.5 million (\$30,000) for year 2000, received in 2002, was expended on the purchase of computers and photocopiers. But most of the subsequent allocations were spent on collection development.

Introduction

For long, Nigerian university libraries, and indeed libraries in the other sectors of education, have faced constraints in developing their collections. These problems are due to poor economy, inadequate funding and the misappropriation of funds meant for collection development, etc. Worried by these developments, which have always led to insufficient and sometimes, non-acquisition of essential books, journals, etc, the Government of the Federal Republic of Nigeria has had to come up with intervention measures to make information materials available for research and teaching. The three intervention measures were The World Bank Federal Universities Development Sector Adjustment Credit, the Petroleum (Special) Trust

Fund (PTF) National Educational Materials Procurement Programme, and the Education Tax Fund (ETF).

The constraints faced by Nigerian university libraries in the area of collection development is a perennial phenomenon, except in the early post-independent era. For example, barely seven years into independence, the country fought a civil war which lasted between 1967 and 1970, necessitating the committal of virtually all its foreign exchange earnings to the prosecution of the war. This was to the detriment of the provision of social services including the funding of university education. Some policies were introduced by the government which were inimical to book and journal importation (Ekoja, 1992).

Non-importation of books, journals and other essential educational materials by Nigerian tertiary institution libraries had adverse effects as more than 90% of their needs come from overseas publishers and producers. Studies by Anyakoha (1979) and Banjo (1982) reported with respect to University of Nigeria, Nsukka and Nigeria Institute of International Affairs respectively that orders placed by their libraries were rejected by overseas suppliers because of previous experiences of non-payment of orders by other Nigerian libraries. Also, Osun-Benjamin (1985) and Akobo (1988) reported instances whereby libraries took between three to five years to receive orders they placed for foreign materials. The purchase of books and monographs suffered almost the same fate as journal subscription, especially with the devaluation of Nigerian currency in the 1980s.

The difficulty of getting foreign books and journals by Nigerian university libraries was because "library expenditure as a percentage of university recurrent expenditure dropped to as little as one percent in some institutions" (Anafulu, 1996). This was corroborated by Ekoja (1992) that between 1983/84 and 1989/90, the yearly allocation to Usmanu Danfodiyo University Library was between 1.02% and 1.85% of the University's total recurrent expenditure.

This trend in inadequate funding of university libraries and subsequent inadequate purchase or outright non-purchase of foreign material was worrisome to university lecturers and administrators, university librarians and other stakeholders in the system. The awareness brought on government facilitated the negotiation for and securing of the \$120 million agreement with The World Bank for the refurbishment of federal universities. Of this amount, 43%, i.e. \$51.6 million, was for the procurement of library books, journals, equipment, etc, the receipt of which began in 1993 by federal university libraries. By the time this arrangement was truncated in 1996, 214,000 volumes of books and 12,000 journal titles had been received by the beneficiaries libraries.

Owing to the poor performance of statutory organs (ministries, parastatals, etc), the Petroleum (Special) Trust Fund (PTF) was established as an intervention organ to

complement the federal government efforts in the provision of socio-economic projects and services. Decree 25 of 1994 which established the PTF mandated it to intervene in seven sectors, viz roads and waterways, health, education, water and food supply, security services, etc. (PTF, 1998). The Fund spent a lot of money and made impact on the socio-economic life of Nigeria.

In 1998, PTF allocated ₦11.4 billion (US\$ 142.5million) for the rehabilitation of facilities in selected educational institutions across the country (NUC, 1998). The PTF also had the Educational Materials Procurement Programme, which included the purchase of books for distribution to libraries of educational institutions. The beneficiaries of this programme included the 40 federal and state universities, three language centres and the National Mathematical Centre. They received several thousands of volumes of books and stationery items through the National Universities Commission in December, 2000 (NUC, 2000) and February, 2001 (NUC, 2001).

The Education Tax Fund (ETF) was one of the recommendations of the *Report of the Commission on Review of Higher Education in Nigeria*, otherwise called *Gray Longe Commission Report* of 1977 (NUC, 1997). ETF was as an intervention measure to complement statutory allocations for education which were inadequate. This came as a result of an agreement between the Academic Staff Union of Nigerian Universities (ASUU) and the Federal Government in 1992. And the Education Tax Decree No.7 of 1993 was promulgated to this effect. The decree imposes a tax obligation of 2% on the assessable profits of all companies registered in Nigeria.

The proceeds of ETF are shared for university education (25%), polytechnic education, (12.5%), colleges of education (12.5%), secondary education (10%) and primary education (40%). The allocations are to be utilised for work centre and prototype development, staff development and conference attendance, library system, research and equipment development, etc.

Between 1994 and 1998, the Government had collected and disbursed ₦7.7 billion (US\$ 120 million) ETF proceeds of which ₦1.75 billion (US\$ 29 million) went to the universities whose libraries were not direct beneficiaries. Between 1999 and 2001, ETF had netted ₦32 billion (US\$ 400 million) and from the year 2000 the Government had directed that 5% of all accruable ETF proceeds be allocated for library development and be specifically disbursed for that purpose (Owuamanam, 2002).

A lot of material and human resources have gone into these intervention measures so that libraries could benefit from them, especially for the acquisition of up-to-date books, journals, etc. It is therefore useful to assess the impact of these intervention measures on collection development in Nigerian university libraries. This study was carried out with reference to Abubakar Tafawa Balewa University Library, Bauchi.

Research Methodology

In order to attain the objective of this study, documentary sources relating to the intervention of The World Bank, PTF and ETF in assisting ATBUL were analysed. The descriptive/survey research method using specifically the case study approach was adopted for this study. In collecting data, documentary sources such as official files, correspondences, etc, were perused.

Findings

The findings are presented according to the three intervention programmes in the following order.

- (a) The World Bank Federal Universities Development Sector Adjustment Credit
- (b) The Petroleum (Special) Trust Fund National Educational Materials Procurement Programme and
- (c) The Education Tax Fund.

The World Bank Federal Universities Development Sector Adjustment Credit

ATBU Library received eleven batches of The World Bank books between 1992/1993 and 1994/93. In all, a total of 3,331 titles in 4,756 volumes costing \$233,198 were received under The World Bank credit facility. During the period that the library received books from The World Bank, the total number of books acquired were 4387 titles in 7092 volumes. This means that 1,056 (24.08%) titles in 2336 (32.94%) volumes were acquired through normal purchase (i.e. using book fund) and gifts. Gifts accounted for about half of these figures. Thus, The World Bank book titles and volumes accounted for 75.92% and 67.06%, respectively, of total book acquisitions for the period.

Similarly, The World Bank supplied 156 journal titles at a cost of US\$ 155266.85 during the three-year period 1993-1995. During the year 1993, the library received 110 journal titles, of which The World Bank supplied 60 journal titles, which represented 54.5% at the cost of US\$ 69017.94. The remaining 50 titles were purchased locally by the library at a cost of US\$ 1352.499.

In 1994, 41 journal titles of the 95 titles received by the library were supplied by The World Bank. The 41 titles cost US\$ 46,432.85, while the remaining local titles cost US\$ 995.34. In 1995, the total journal titles supplied by The World Bank was 104 titles, 55 (52.88%) of these costing US \$37,011.61 and the remaining 49 cost \$1672.20.

The general complaint with the supply of journals under The World Bank scheme was that some volumes were not supplied in full, as some issues were missing. For example, in 1993, out of the 60 titles, eight were not supplied in full. However, access to the current journals, and indeed the books too, had a lot of positive impact on members of the University community in that they were kept up-to-date in their respective areas.

The Petroleum (Special) Trust Fund (PTF) National Educational Materials Procurement Programme

Under the PTF National Educational Materials Procurement Programme, a total of 151 titles of books in 5,082 volumes were received by ATBU Library. On the average, 34 copies per title were received, but in some instances, several hundreds of copies per title were received. For example, the library was supplied 666 copies of *Groundwork of Nigerian History* written by Obaro Ikime and 348 copies of *Introduction to Computer Science* written by Akin Fapohunda. Out of these, only 10 and 20 copies respectively were processed for the use of readers. In all, 1289 (25.36%) volumes out of the 5082 which were received were processed leaving a surplus of 3793 (74.64%) volumes unprocessed.

It is interesting to indicate here that in the year 2000/2001 in which the PTF books were received ATBU Library did not purchase any single book but relied solely on gifts for its stock acquisition. The total gift received was 239 titles in 5,171 volumes. Therefore, the PTF volumes of 5082 accounted for 98.27% of the total Library collection for the year.

Considering that the benefiting libraries under the PTF programme would not process for use all the copies of the titles they received, the National Universities Commission (NUC) directed university libraries through a circular No. NUC/LSU/07 of 14th March 2001 that the excess copies be sold at subsidised rates to the members of the communities of the universities.

The Education Trust Fund

The ETF has been sending money to universities and other educational institutions since the mid-1990s. But it was only from the year 2000 that the fund began to allocate specific amounts to the libraries of these institutions. The allocation for ATBU Library for 2000 was ₦3.5 million (\$30,000), 75% of which was released in January 2002. The University sought for and got the approval of the Fund that it would use this allocation for the purchase of computers and photocopiers. The University has reached the decision to purchase ten micro-computers and two photocopiers with the money. The computers are to be used for the Library's internal network.

Conclusion

Notwithstanding the bad light in which IMF and The World Bank programmes are viewed in developing countries, The World Bank Books project was the best intervention measure so far and had had the greatest impact among the three that ATBU Library had enjoyed. Under this Project, the Library had the free hand to select relevant books and journals up to the amount it was entitled. In selecting books, it maximised their purchase, ensuring that many titles were acquired, thus getting on the average 1.5 copies per title.

The PTF programme was the most absurd intervention measure. The Library had no opportunity of determining what it received. Thus, several hundreds of copies per title were received as if the Library was running a bookshop. If the Library had had an input, it would have maximised the purchase of titles buying or selecting averagely four copies per title as provided for in its collection development policy. It would thus have been able to bring in about 1,271 titles as against only 151 which it received.

The ETF programme is on-going, unlike the other two which were on a once and for all basis or had specific time frame. It is hoped that after the purchase of computers and photocopying machines, subsequent allocations would be used for collection development in order to bring into the Library current journals and books which are presently lacking in its existing collection.

References

- Akobo, D.I. (1988) Acquisitions of Library Resources under SFEM. In: S.M. Lawani *et al* (eds.) *Strategies for Survival by Nigerian Academic and Research Libraries During Austere Times*. Ibadan: Nigerian Association of Agricultural Libraries and Documentalists, and Academic and Research Library Section of the Nigerian Library Association, pp. 87-91.
- Anafulu, J.C. (1996) Trends in Funding Academic Libraries in Nigeria. *Library Bulletin of the Nigerian University Library System*, 1 (2) 9-33.
- Anyakoha, M.W. (1979) "Our Stars are to Blame" Persistent Problems of Collection Development at Nsukka. *Libri*, 29 (1) 27-25.
- Banjo, A.O. (1982) Effects of Government Policies on Library Acquisitions in Nigeria. *Lagos Librarian*, 9 (1) 13-14.
- Books in Print (1992) 1992-93 Vols.1-4. Authors. New Jersey. R.R. Bowker
- Douglas, E.O. (1989) Problems of Collection Development in a Depressed Economy: The Academic Library Perspective. *Paper Presented at the National Seminar on Constraints of Academic/Research Libraries Development in Nigeria*. Ilorin. 14-16 September, pp. 4-5.
- Ekoja, I.I. (1992) The Effects of University on Collection Development in Nigerian University Libraries with Particular Reference to Usmanu Danfodiyo University Library, Sokoto. *International Information and Library Review*, 24: 173-187.
- National Universities Commission (1998) PTF Farms N11.4bn for Education. *University System News*, 9 (2) 16.
- National Universities Commission (1997) Spotlight (on) Education Tax Fund. *University System News*, 7 (2) 9.
- National Universities Commission (2000) Circular No. NUC/LSU/07. Abuja NUC.
- National Universities Commission (2001) Circular No. NUC/LSU.07. Abuja NUC.
- Osun-Benjamin, J.A. (1985) Library Cooperation as a Feasible Proposal in Coping with the Nigerian Situation. *Lagos Librarian*, 12 (1&2) 55-56.
- Owuamanam, J. (2002) ETF Nets N32b. Accuses Oil Firms of Evasion. *Saturday Punch*, March 2: 9.
- Petroleum (Special) Trust Fund (1998). News Analysis. PTF- Three Years After. *PTF News*, March pp.1-2.

* Innocent Ekoja is a principal librarian at Abubakar Tafawa Balewa University Library Bauchi, Nigeria. He attended Ahmadu Bello University, Zaria, and the University of Ibadan, both in Nigeria. He holds BLS, MLS and PhD.

Book Review

Into the Information Age: Computerization of the Copperbelt University Library. Edited by Maurice Chimfwembe Lundu and Charles B. M. Lungu Oxford: INASP, 2002, 123 p. (ISBN: 1 902928 10 5).

This book is a collection of articles on the lessons learnt from computerisation process of the Library of the Copperbelt University in Zambia. There are nine chapters in all. The first article, written by M.C. Lundu, entitled "The Copperbelt University Library and its Environment," gives a brief history of the University from the time, in 1987, when it transformed from being a campus of the much older and better known University of Zambia to the present status. It provides some pertinent information about the University Library, including the Library's mission statement. The article is a fitting prelude to the others that follow. The second article, by Lungu entitled "Towards Computerising the Copperbelt University Library: Dreams, Frustrations, Opportunities, Options and Achievements" discusses the importance of long-term planning. Further, the article demonstrates that while long-term planning is critical, it is never entirely devoid of problems.

The third article written by M. Lundu focuses on "Donor Support and the Computerisation of the Copperbelt University Library." In most African countries, it would be impossible to achieve much without external assistance. Dependence on donor support, however, raises the rather thorny issue of sustainability. Although Lundu does address it under the section entitled – somewhat predictably – "Sustainability" one does not really go away with a sense of satisfaction that the issue has been addressed with the seriousness it deserves.

Augustine Mwamba writes on "The Computerisation Process: System Design and Implementation." The Copperbelt University Library considered three options, namely turn-key system, in-house system development and system adaptation, before deciding on the first. Turn-key systems do have their advantages, particularly where such a system is not being developed from scratch but has been used – and thus tested – at other sites. It is interesting to note that the STYLIS system was selected despite the fact that some modules, including the serials module that is quite crucial for academic libraries, are not operational. Another interesting point to note is that, as Mwamba puts it, "STYLIS is a licensed software" and as such the University "is required to pay an annual user license fee for the software", which has a very direct bearing on the issue of sustainability we alluded to earlier. Godfrey Mbebe describes "The basic modules and its products 1993-1998" in Chapter 5. He discusses the practical aspects of creating, maintaining and updating a database of the software adopted by the Library. In Chapter 6, Godfrey Mbebe looks at the actual work of

computerisation, giving his article the title, "Computerizing Operations in the Loan System." He concurs with the software vendor that "the STYLIS loans module is very versatile," and goes further that "the OPAC offered far more efficient information retrieval possibilities ..." This initial satisfaction with the chosen system is heartening, although not totally unexpected considering that the comparisons are made against the manual system. In Chapter 7, Emmanuel Chitwamali writes on conducting a stock review exercise in a newly automated environment and discusses the challenges of using the online database as the shelf-list. In Chapter 8, entitled "Towards an Electronic Information Service: From Traditional To Digital Provision," G Chelemu discusses the use of "electronic reference services", which in this case are "mainly CD-ROM and the Internet Services", in the Copperbelt University Library. In Chapter 9, "The Copperbelt University Library Automation Experience: Concluding Remarks" by Charles Lungu points out that the selected software is not Windows-based. Surely, if the selection process were as thorough as the earlier chapters seem to suggest, the wisdom of selecting a non-Windows-based software would have been questioned much earlier? This may seem rather harsh, but we have been hearing about the death of MS-DOS, and the rise of the so-called GUI (Graphical User Interface) and WIMP (Windows, Icons, Menus and Pointer) for quite some time now.

There is no doubt that this is a useful book as it has documented the computerisation experiences for others to learn from, and if for that reason only, Lundu and Lungu deserve to be commended for their effort. As Diana Rosenberg writes in the Foreword, "African countries do have specific realities and needs," and sharing experiences in this manner "is vital for survival in an environment where guaranteed funding is not available" as it "helps stop the same mistakes being made again and again."

I. C. Mogotsi

Lecturer

Department of Library and Information Studies
University of Botswana

Professional News and Events

PERI Programme Bridges Information Gap

The information gap between researchers and lecturers in universities and research institutes in developed countries and African countries is being narrowed through the efforts of INASP's PERI programme (Programme Enhancement of Research Information). Lecturers and researchers in Ghana, Kenya, Malawi, Tanzania, Uganda, Zambia and Zimbabwe now have access to 7000 full-text online journals in science, technology, medicine, social science and humanities. This facility, is at no cost to the institutions benefiting from it.

African Published Books available in USA through ABC

Books published locally in Africa are now to be available in the United States of America through African Books Collective (ABC) based in the UK. In an agreement signed with the Michigan State University Press in July 2002, ABC books will be exclusively marketed and distributed in North America by the Michigan State University Press. ABC is a non-profit organisation based in Oxford, UK. It is the worldwide marketing and distribution outlet for over 1000 titles published in Africa.

Botswana Library School introduces Bachelor of Information Systems (Information Management) Programme

The Department of Library and Information Studies, University of Botswana introduced the Bachelor of Information Systems (BIS) degree programme at the beginning of the 2002/2003 session. The BIS (Information Management) programme is designed to produce graduates with knowledge, skills and understanding of: (i) the relationship of information and information technology to organisational needs, (ii) current management practice in the development of information systems, their use and associated policy formulation and analysis, and, (iii) the value of research, critical thinking and effective communication in the management of information systems. It is anticipated that the graduates will be ready to fulfil key roles in information systems and related industries in various positions such as database administration, information resources manager, project managers, information systems managers and so on.

The programme extending over eight (8) semesters, is part of the BIS degree which is offered in three streams: BIS (Computer Information Systems); BIS (Information Management); and BIS (Business Information Systems) by three departments respectively: Department of Computer Science in the Faculty of Science; Department of Library and Information Studies in the Faculty of Humanities; and the Department of Accounting and Finance in the Faculty of Business. As a result there are a number of shared courses, such as those on operating systems, computer communication, database concepts, and these are taken by students in all the streams. There are also differences as expected, and for that, each stream provides an in-depth coverage so as to produce highly qualified graduates with relevant expertise.

Forthcoming Conference

October 28 - 31, 2003, Canberra, Australia 8th Interlending and Document Supply International Conference.

Theme: Breaking Barriers - Reaching Users in a Digital World
Sub-Themes:

- Equity to access
- Empowering the user
- International sharing
- Automating services: lessons learned
- Legal implications of sharing resources: copyright and licensing; when to borrow, when to buy
- Effects of changes in publishing on sharing resources
- Consortia: new collaborative access mechanisms
- Education for practitioners
- Best practice processes

For further information about the conference visit the conference's website at <http://www.nla.gov.au/ilds>

Report of the Training Course on Research and Writing Skills for Library, Archives and Information Science Authors in Nigeria, Held at the University of Ibadan, Nigeria, 7- 11 October 2002.

This training course was co-sponsored by the International Network for the Availability of Scientific Publications (INASP) and the African Journal of Library, Archives and Information Science (AJLAIS). The training course was held in response to the declining quality of manuscripts submitted to AJLAIS from Nigeria.

The objectives of the training course were (a) to improve the research and writing skills of librarians, archivists, information scientists and other information professionals; and (b) to motivate participants to train and encourage their professional colleagues in writing and research skills. The course content covered:

- Overview of research and writing skills
- Literature review
- Research designs and data collection
- Tools of research – statistics and computer
- Internet resources
- Research presentation and discussion
- Basics of writing : aspects of grammar, word choice and style
- Writing a research paper – practical
- Getting published in a journal.

Twenty one participants from all over Nigeria took part in the training course. The opening ceremony took place on Monday 7 October 2002. The ceremony was witnessed by the library and information science community in Ibadan, the host city of the training course. The chairperson of the opening ceremony was Prof. (Mrs.) P.O. Fayose, the Head of the Department of Library, Archival and Information Studies, University of Ibadan, Nigeria. Prof. (Mrs.) Remi Ayodele-Bamisaiye, the Dean of the Faculty of Education, University of Ibadan, Nigeria presented the welcome address. A keynote address was presented by Prof. L.O. Aina, Editor-in-Chief of the African Journal of Library, Archives and Information Science. Goodwill messages were received from INASP and the Nigeria Library Association.

At the end of the course, the participants expressed satisfaction with the treatment of the various topics. The consensus of all the participants was that the training course had greatly improved their knowledge of research and writing skills. They promised that this would be reflected in the manuscripts they would submit in future. The participants also expressed that they would facilitate the organisation of such a training course for their professional colleagues when they get back to their different stations.

For further information about the training course, please contact: The Course Co-ordinator, INASP/AJLAIS Training Course on Research and Writing Skills for Library, Archives and Information Science Authors in Nigeria, Dr. Iyabo Mabawonku, P.O. Box 20492, Ibadan, Nigeria.