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By

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ABSTRACT

*This paper examines the **Effect of Library Management Software on the Growth and Development of Library Services.** It focuses on the following sub-headings: The Concept of Library Management Software; Library Management Software; Brief History of Software Usage in Nigerian Libraries; Features of Good Library Management Software; Criteria for the Library Software Selection; Prospects of Library Management Software; Problems Affecting the Utilization of Library Management Software; and the way forward. It concludes that the Library Management Committee has to be careful when scouting for any suitable software package, the most credible software package that would adequately meet the information needs of their libraries should be considered or selected. Also, there is need for the installation of the most efficient, cost effective and user-friendly library software package. Librarians and other library personnel should be trained and re-trained to enhance their efficiency and effectively handle the selected and procured library software package.*

Keywords: Library Management; Library Management Software; Library Growth; Library Development; Library Services

INTRODUCTION

Library according to Yaya (2019), can be defined as a place, well ventilated-room(s) or building(s) sited in a serene environment where books, non-books and other educational resources are being selected, acquired, processed, organized and carefully displayed on shelves for reading, research and reference purposes. Pise (2016) asserted that library is a fast-growing organism. From time to time, new educational resources are added to its collections in order to meet the information needs of library users and the parent institution in support of her curricula and programmes. The author reiterated that the ancient methods of maintaining library collections are no longer dynamic and efficient in this 21st century where the world is now a

global village due to technological advancement. It is now imperative to efficiently process and make library resources available to users as every user his or her book. For this to be effectively done there is need to automate library resources and the means to have this done is by the installation of user-friendly software package.

It is postulated that "we are living in the age of information explosion. This is made possible by the Internet and World Wide Web technologies. These technologies provide opportunity for cost, effective access to broad range of information resources and enhance communication and collaboration. The network of information support search and display of information from organized collections and distributed all over the word" (Sen, Jain & Ranjan, 2013, 9). "Information Communication Technology (ICT) and digital library system play an important role in present day's higher academic system. Digital library is important sector of information system and to meet the information needs" of numerous information seekers that usually visit the library for one information or the other (Harilal, 2018, p. 227).

Consequently, the availability of suitable library software package has also played an important role in processing, organizing and disseminating information resources to various information seekers within and outside the library building. Although, there are many versions of software available for library to efficiently manage her daily increasing collections but most of the software are non-standard and most of them were developed by computer personnel without the input of professional librarians (Pise, 2016). The importance of software in any library cannot be over emphasized because it is the software which supplies power to the computer to process such data in order to meet the user's information need and thereby proffer solutions to the problem at hand. It has been stated that the rapid increase in the capabilities of computer systems has not been matched by corresponding increases in availability and quality of software that are being used in most libraries.

The purpose of this intellectual effort is to discuss the prospects Library Management Software. It specifically focuses on: concept of software, library software, brief history of library software usage in Nigerian libraries, features of library software, criteria for library software selection, prospects of library software, problems affecting the effectiveness of library software, proffering solutions to the identified challenges and conclude the chapter by encouraging the installation of cost effective and user friendly software in processing the educational resources stocked by the library in this electronic age instead of continue using the arcade method of traditional librarianship.

THE CONCEPT SOFTWARE

According to Adeyokun and Owojuyigbe (2019), Meadow (1982), software is an instruction that run the computer system to perform a desired operation in an organization. Software information

is the set of instructions or programs which are used to direct the operations of a computer or other hardware. Similarly, Silppl and Sippl (1979) referred to Software as those internal programmes of routines professionally prepared or developed to simplify programming and computer operations. These routines permit the programmer to use his own language (English) or mathematical (Algebra) in communicating with the computer to carry out a desired operation using computer system in the organization. The authors reiterated that software are various programming aids that are frequently supplied by the manufacturers to facilitate the purchaser's efficient operation of the equipment. Such software items include various assemblers, generators, subroutine libraries, computers, operating systems and industry, application programmes.

Basically, there are two main types of software: application software and system software:

Application Software
A Computer application software is a set of programmed instructions, which tells the computer how to execute a specific task on the particular set of data provided. Application software for libraries contains a sequence of instructions designed book order, list of journals received and numerous other specific tasks done in library operation. Application software can be categorized in a number of programs. These include special purpose programs and standard application software programs which are subdivided into dbase 111, Lotus1,2,3PC, word star, CDS/ISIS, amongst other application software that are mostly used in the organization to perform some operations in order to meet her set objectives (Patel, 1996).

Application software is installed to perform the following services in the organization:
- o Organizational information processing (data processing and MIS)
- o Mathematical, statistical and modeling
- o Information processing and retrieval
- o Computer assisted instructions
- o Data communication
- o Process control

Application software or programs also known as Data Base Management systems (DBMS). It refers to shared collection of data, which is used by many application programmes. The software, which equally handless and access all database in the organization is known as data base management (DBMS). The software is expected to:
- Provides a way of describing the structure of data.
- Enables existing data to be incorporated into the new database.
- Provides facilities for the manipulation of data from application programmes.
- Enables the database be maintained and updated as and when necessary.

Software packages can be developed by individuals, institutions, or they can be purchased from software developing companies. It can be categorized under the class of (a) User application

programs, and (b) Application software packages. They are developed to support general tasks like word processing, database management, etc. Examples of application software being used in a library are, Alice for windows, SLAM, GLASS, X-LIB, GREENSTONE, DBASE IV, KOHA, NEWGENLIB, DSPACE, etc.

On the other hand, **System Software** is the set of programs developed through which a general-purpose computer system is made to perform specific tasks. It contains a complete and clear description of each task in terms of available operations of the computer. In other words, software may be conceived as a set of programs for a computer. Each program is a complete specification of the processing to be performed on the data supplied to the computer. A collection of these programs or instructions is referred to as computer software.

Both are essential before any useful work can be done and the expected result(s) obtained by the users. System software involves those programmes, which enable a computer to function and control its operation. They are routines residing in the computer's memory, which facilitate the use of the hardware and help the computer system run quickly and efficiently. They are sequences of instructions called computer programs that are developed or written by the computer programmers. These programs are to be installed in a device called **hardware**.

Thus, hardware are the physical components of the computer system that we can see, touch and physically displayed on a table called desktop or handily displayed as laptop. They are electronic devices or machines that enable software to effectively carry out a given instruction(s). They vary in size, shape, texture, capacity and colour depending on the manufacturer. They are similar to any other electrical or electronic machines such as the stereo system, video recorder, power point machine amongst others that can be physically handled and moved from place to place to performed a desired function. The computer system is helpless or powerless and cannot do anything useful without being instructed or programmed to perform one operation or the other. Therefore, hardware and software work hand in hand. In other words, one cannot function without the other. Software could be generally classified into Operating System and Utility Software, Compilers/Assemblers and Application Software.

Operating System and Utility Software
 According to Patel (1996), software is usually made by the manufacturers for sorting, merging, copying, pasting, editing, and other operations in the organization. The software is further classified into Single - user system and Multi-user system. Single user system works in compliance with CP/M for 8 bit computers, CP/M for 16 32 bit computers, Pc-DOS, MS-DOS and for IBM or IBM compatible PCs. On the other hand, Multi-user system is in compliance with UNIX for 16/32 Bit computers, and RSX-11 for PDP-11 range computers.

While ***Operating Systems (OS)*** serves as an interface between the user and the computer, OS is a large and complex program that determines how a particular computers CPU accepts incoming signals, transmits ongoing signals, allocates storage space to individual use and program, controls peripheral devices, permits access to various files of data. Purpose of the O.S. is to manage computer hardware so that it is used as efficiently as possible system (Meadows, 1982, Silppl & Sippl, 1979). The authors opined that ***Utility Programmes*** on the other hand, are routine programmes of general nature which are often required to be used during the processing of the application system and testing of the programmes. Utility programmes may be obtained from computer equipment manufacturers or companies specializing in software development or may be developed by local programmers.

Compliers and Interpreters

While Compilers translate the complete programme, written in a high-level language into equivalent machine level programme before it is actually executed by the computer to carry out the expected operations in the organization. In other words, Compiler software can be categorized into machine language, assembly language and higher language. Examples include plan auto coder, BASIC COBOL, FOTRAN, etc. On the other hand, ***Interpreter*** translates each instruction separately, as the computer needs it in order to process a given task. Like assemble, both compilers and interpreters' equipment were developed by manufacturers (Meadows, 1982, Silppl & Sippl, 1979). Another area that needed to be mentioned and briefly discussed in this paper is human ware.

Human ware: These are human beings who manipulate both the hardware and software to serve various purposes in which a computer is involved. It is human being that produces or develops the software and fashions it the way he wishes it could work. This comprises of librarian, library officers, computer operators, computer engineers and other personnel who make use of the computer system to carry out one function or the other in an organization.

LIBRARY MANAGEMENT SOFTWARE

The term library software is the educational software package designed and developed for the effective processing and dissemination of the library resources to various library users within and outside the library building. "The era of the switch from pure book-based services to web-based services through automation has come to stay. There is the need for academic libraries to embrace this change and reflect it in their services" (Ezechukwu & Adewole-Odeshi, 2018). Library automation is the means through which this could be achieved. Library management software is a programmed instruction used to process and manage the whole database of a library. Software helps in keeping records of all the educational materials like books, periodicals, DVDs, CDs, and other relevant resources stocked in a library. It is used in schools, polytechnics, colleges of education, universities and at many more places which provide full support to the

librarian and help in easy management and retrieval of library resources (Visionet, 2019). Library software is otherwise known as library management software or library automation software. The terms are encompassing and are used interchangeably to mean the same thing. The software is the set of instructions that is being used to manage the automation of the library collections. It helps the library to easily and adequately process its educational resources before they are displayed on the shelves for library users to access in order to meet their various information needs.

Libraries can successfully operate their assigned services to their users with the Library Management System (LMS) which is also called Integrated Library System (Amando et al, 2018). It is cumbersome for libraries to still be operating manually without the use of library management software in this modern era of information technology (IT). According to Kumar et al (2014), LMS is an application which refers to library systems which are generally small or medium in size. It is used by librarians to manage the library using a computerized system where he/she can record various transactions usually taken place in the library such as issue of books, return of books, addition of new books, registration of new students and other services performed by the library personnel.

Furthermore, LMS is a computerized system which helps users (librarian) to manage the library daily activity in electronic format. It reduces the risk of paper work such as file lost, file damage and time consuming. It can help users to manage the transaction. Library Management Software can either be Proprietary or Open Source. Koha and most library software are examples of open-source software that is increasingly been adopted in the University, Public and School Libraries today in Nigeria. Pankaja and Mukund (2013) defined open-source software as a computer software with its source code made available and licensed with an open-source license in which the copyright holder provides the rights to study, change and distribute the software for free to anyone and for any purpose. The authors noted that Open-source software is very often developed in a public domain and in a collaborative manner. Open-source software is the most prominent example of open-source development and often compared to (technically defined) user-generated content or (legally defined) open-content movements while they also defined Proprietary software.

The term proprietary is derived from the Latin word *proprietas* meaning property. Proprietary software is computer instructions (software) licensed under the exclusive legal rights of the copyright holder. Proprietary software is developed by a person, body or firm who has rights of using existing or developing new tools to create new software. A proprietary software developer sells or provides his or her intellectual product (creation) under some concrete conditions which should be followed in order to avoid any legal issues. In general, these concrete conditions involve using software with a purchased license, within the permitted boundaries, no modification is allowed, no further re-distributions and no reverse engineering is to be applied (Amando, et al, 2018)

It can be noted that if librarians are to be effective in discharging various library services to the communities, there is need for them to use open-source software that would enable them to efficiently discharge their services, such as library automation, digitization, institutional repository, content management" (Dhamdhere, 2011), information retrieval and for the selective dissemination of information (SDI) services to the targeted information seekers within and outside the walls of the library building. Moreover, for any library to function effectively in this 21st century, it requires a collection of electronically installed programs called software for running the system, for storage, management and access to the library resources (Sen et al, 2013). Therefore, good library automation software can be available in two technologies: Barcode System and Radio Frequency Identification (RFID) System.

Barcode System

Barcodes are used in libraries to label books, journals, magazines, CD & DVDs. Each and every book and other items are assigned unique 12- digit barcodes. It contains all information about the product. In Library Management system, whenever students return or are issued books, the system fetch the bar code number and library personnel can make entry of such book in the computer systematically. Library Management system helps in systematic management of books (Sen et al, 2013).

Benefits of Using Bar Code System

The aforementioned authors listed the benefits to include:

- Improved inventory management
- Faster check-in and check-out facility
- Easy to sort books
- Reduced staff workload
- Increase accuracy and efficiency
- Improve circulation capabilities

Radio Frequency Identification (RFID) System

Also, Sen et al (2013) postulated that Radio frequency identification (RFID) system that uses electromagnetic fields to automatically identify and track tags attached to books. There are several ways of identifying tags but the most common is to store a serial number. The chip and antenna attached together are called an RFID tag. The RFID reader or scanner converts the RFID tag information into digital information which will further seen in computer and stored for future use.

It could be observed that while most library software packages are installed to perform some basic operations often performed manually by the library personnel, others are meant to undergo Library and Information Storage and Retrieval services. For example, STAIRS (an acronym for

Storage and Information Retrieval System) was developed by International Business Machine (IBM) and it is to be used on IBM machines and mainframe computer series.

However, Computer software for library and information operations can be categorized into the following major groups:

- Library Management functions: Acquisition, cataloguing, circulation and serials control;
- Management support functions: Statistics, MIS, accounting and Budget Control; and
- DBMS & information retrieval functions: Database creation, database searching, generation of SDI, indexes and bibliographies, directory generation, etc

Examples of some library software packages are presented in Table 1 (but not limited to the listed software packages). Since there are many software packages and it may not be possible to discuss all the software packages in detail, only few selected software packages are briefly discussed.

Table 1: Examples of Library Management Software Packages and Manufacturing Agencies

S/N	Library Software Package	Manufacturing Agency
1	Acquas, Ascat, Ascir, Asire Seras (AAAAS)	Ober Information System, Calcutta
2.	Alice for windows	Softlink India, Softlink International, Australia
	Archimede	Laval University Library, Canada.
3.	Archives (1,2,3)	Minifax Electronics (P) Ltd., Bombay, India.
4.	ARNO	University of Amsterdam, Tilburg University, and the University of Twente.
5.	Atrium Digital Exhibits	DuraSpace
6.	Automation of liBraries and Centres of Documentation (ABCD)	BIREME (WHO, Brazil) in collaboration with the Flemish Interuniversity Council, Belgium
7.	Basisplus & Techlibplus	Information Dimension Inc. (IDI), USA (Marketed in India by NIC)
8.	BitCurator	School of Information and Library Science at the University of North Carolina and the Maryland Institute for Technology in the Humanities.
9.	Catman	INSDOC, New Delhi, India
10.	CDSware	European Organization for Nuclear Research.
11.	Computer Assisted Information/Library Retrieval System (CAIRS)	Leatherhead Food Research Association Surrey, England, 1972
12.	CDS/ISIS	UNESCO, 1985
13.	DBASE IV	Jet Propulsion Laboratory (JPL), Califonia,

		USA, 1971
14.	Defence Library Management System (DELMS)	DESIDOC, New Delhi, India.
15.	DSPACE	Massachusetts Institute of Technology (MIT) Libraries and Hewlett- Packard (HP) Labs.
16.	DSpace-CRIS	Cineca
17.	Eprints	University of Southampton
18.	Fedora	University of Virginia and Cornell University
19.	GLAS-Graphical Library Automation System	Electronic Online Systems Integrational (EOSI), 1996,
20.	Goobi	Saxon State and University Library Dresden
21.	Golden Libra	Golden Age Software Technologies, Bombay, India
22.	Granthalaya	INSDOC, New Delhi
23.	Grateful Med	National Library of Medicine, USA
24.	Greenstone	New Zealand Digital Library Project at the University of Waikato
25.	Hydra	Stanford University, University of Virginia & University of Hull
26.	i-Tor	Innovative Technology-Applied- Netherlands
27.	Inmagic Software	Warner-Eddison Associates, 1980
28.	Invenio	CERN (European Council for Nuclear Research)
29.	IR+ (IR PLUS)	University of Rochester
30.	The IV + IV System Software	Institute for Machine Documentation (IMD) Graz, Australia
31.	KOHA	Katipo Communications for the Horowhenua Library Trust in New Zealand, 1999
32.	Kramerius	Czech libraries
33.	Krvger Library Manager (KLM)	Blitz Audio Visuals, Pune
34.	Lamp	Information Systems, Bangalore
35.	Lib Data	Murphy Associates, Secunderabad
36.	Lib Info	M.N. Dastur & Co., Madras
37.	Libman	Datapro Consultancy Services, Pune
38.	LIB+	Raw Materials Research and Development Centre in Abuja, Nigeria
39.	Libra	Ivy System Ltd., New Delhi
40.	Librarian	Soft-Aid, Pune
41.	Library Catalog System (LCS)	Ultra-Business Systems (P) Ltd., Bangalore
42.	Library Management	Raychan Sysmatics, Bangalore
43.	Library Management System (LMS)	U & I Software (P) Ltd., Bangalore
44.	Library Manager	System Data Control Pvt. Ltd., Bombay
45.	Libris	Frontier Information Technologies Pvt. Ltd
46.	Lib Soft	ET & T Corp., New Delhi
47.	Libsys, Micro-Libsys	Info-Tek Consultants Pvt. Ltd., New Delhi/ Libsys Corp., New Delhi
48.	ListPlus	Computer Systems, Bangalore

49.	Loan Soft	Computek Computer Systems, Hyderabad
50.	Maitrayee	CMC, Calcutta (for the CALIBNET Project)
51.	MECSYS	MECON, Ranchi
52.	MINISIS	International Development Research Centre, Canada
53.	MyCoRe	University of Essen
54.	NEWGENLIB	Versus Solutions Pvt Ltd, via Kensavan Institute of Information and Knowledge Management, Hyderabad, India, 2005.
55.	NILIS	Asmita Consultants, Bombay
56.	Nirmals	Nirmal Institute of Computer
57.	OPUS	University of Stuttgart
58.	Salim	Expertise, Tiruchirapalli, Uptron India Ltd., New Delhi
59.	Sanjay	DESIDOC, Delhi (under a NISSAT Project)
60.	SCI – MATE	Institute for Scientific Information, Philadelphia
61.	SDI Package	Rading Cybernetics (P) Ltd., Secunderabad
62.	Searcher	INDATA, New Delhi
63.	Serials PAC Software	Informatics India Pvt. Ltd., Bangalore
64.	Slim 1.1	Algorythms, Bombay
65.	SOUL	INFLIBNET, Ahmedabad
66.	Suchika	DESIDOC, Delhi
67.	Strategic Library Automation and Management (SLAM)	Locally developed software
68.	STAIRS (Storage and Information Retrieval System)	International Business Machine (IBM)
69.	Super Doc	Thermodata Group, Grenoble, France
70.	TINLIB	Dr. Peter Noerr via World Bank Project, 1985
71.	Trishna	NISTADS, New Delhi (Under NISSAT Project)
72.	Tulib	Tata Unisys Ltd., Bombay
73.	ULYSIS	WIPRO Information Technology Ltd., Secunderabad
74.	UNILIB	M/s. Hindustan Computers Ltd., Bangalore
75.	Wilisys	Wipro India, Bangalore
76.	X-Lib	Raw Materials Research and Development Centre in Abuja, Nigeria

Sources: Patel and Bhargava (1995), Mohandas and Shet (1992), Dhamdhere (2011) and Zaid (2004)

DSPACE

The term DSPACE means Duraspace. The software package was developed by the collaboration between Massachusetts Institute of Technology (MIT) Libraries and Hewlett- Packard (HP) Labs. It functions as a repository for the digital research and educational material produced by members of a research university or institution (Velmurugan & Thavamani, 2016). The aforementioned authors reiterated that Dspace is a ground breaking digital repository system that captures, stores, indexes, preserves and distributes digital research materials. DSpace software platform serves a variety of digital archiving needs. Research Universities and tertiary

institutions worldwide use DSpace to meet a variety of digital archiving needs: Institutional Repositories (IRS), Learning Object (LO), E-thesis, Electronic Record Management, Digital Preservation, Publishing Etc. DSpace is freely available as open source software you can customize and extend. An active community of developers, researchers and users worldwide contribute their expertise to the DSpace Community (Donohue, 2018, np). Tim Donohue stated that DSpace accepts all manner of digital formats. Some examples of items such as: Documents (articles, preprints, working papers, technical reports, conference papers), Books, Theses, Data sets, Computer programs, Visualizations, simulations, and other models, Multimedia publications, Administrative records, Published books, Overlay journals, Bibliographic datasets, Images, Audio files, Video files, e-formatted digital library collections, Learning objects, and Web pages.

Wikipedia (2018, np) noted that "DSpace is an open-source repository software package typically used for creating open access repositories for scholarly and/or published digital content. While DSpace shares some feature overlap with content management systems and document management systems. The DSpace repository software serves a specific need as a digital archives system, focused on the long-term storage, access and preservation of digital content". Also, "DSpace is a digital library system designed to capture, store, index, preserve, and redistributes the intellectual output of a university's research faculty in digital formats which is developed jointly by HP labs and MIT libraries. Dspace architecture is consists of three-layer architecture namely (a) application layer (b) business layer (c) storage layer. There are three layers architecture based on DSpace namely, Application layer, Business layer and Storage layer" (Velmurugan & Thavamani, 2016, p.102).

Features

Wikipedia (2018) listed some most important features of DSpace to include:

- Free open-source software
- Completely customizable to fit user needs
- Manage and preserve all format of digital content (PDF, Word, JPEG, MPEG, TIFF files)
- Apache SOLR based search for metadata and full text contents
- UTF-8 Support Interface available in 22 languages.
- Granular group-based access control, allowing setting permissions down to the level of individual files
- Optimized for Google Scholar indexing

KOHA

According to Phaktanka (2000), Koha is an open-source Integrated Library System (ILS), used world-wide by public, school, academic and special libraries. It was created in 1999 by Katipo Communications for the Horowhenua Library Trust in New Zealand, and the first installation went live in January 2000, so Koha is believed to be the first open source ILS in the world. The

name koha comes from a *Māori* term meaning a gift or donation. Most Nigerian Universities and tertiary institutions libraries are using KOHA software package to process their educational resources.

KOHA Historical Background

Koha was created in 1999 by Katipo Communications for the Horowhenua Library Trust in New Zealand, and the first installation went live in January 2000.

- From 2000, companies started providing commercial support for koha, building to more than 20 today.
- In 2001, Paul Poulain (of Marseille, France) began adding many new features to Koha, most significantly support for multiple languages.
- MARC and Z39.50 was added in 2002 and later sponsored by the http://www.myacpl.org/ Nelsonville Public Library.
- In 2005, an Ohio-based company, Metavore, Inc., trading as LibLime, was established to support Koha and added many new features, including support for Zebra sponsored by the Crawford County Federated Library System. Zebra support increased the speed of searches as well as improving scalability to support tens of millions of bibliographic records
- Paul Poulain co-founded BibLibre in 2007.
- In 2009 a dispute arose between LibLime and other members of the Koha community. The dispute centred on LibLime's apparent reluctance to be inclusive with the content of the http://koha.org/ sites and the non-contribution of software patches back to the community.
- In 2010, LibLime was acquired by another vendor, PTFS.
- In the 2010 librarytechnology.org survey of ILS perception, independent Koha support and Koha support from ByWater Solutions outranked support from LibLime in every single question.
- By 2010, Koha has been translated from its original English into French, Chinese, Arabic and several other languages. Support for the cataloguing and search standards (p. 302-304).

NEWGENLIB

The term NEWGENLIB stands for New Generation Library Software. The software package was developed by Verus Solutions Pvt Ltd, India. While version 1.0 was developed in March 2005, its latest version 3.1.2 was made available to the public domain in May 15, 2015. Its domain expertise was provided by Kesavan Institute of Information and Knowledge Management, Hyderabad, India. It is provided free to all academic libraries. NewGenLib is a fully web based integrated library management software that runs on distributed computers

through a network or server. It can also run on local area networks (LAN) without access to the Internet, although some of the advantages of using it via the web will be lost. It uses a number of well supported and widely-used, reliable and well tested open-source components like PostgreSQL, Apache Tomcat, and Solr Lucene. NewGenLib is entirely Java-based, platform neutral, and uses the following related software technologies in its presentation, web server, database layers and Linux Windows system (Giri, 2015). The author reiterated that NewGenLib is entirely Java-based and platform neutral. NewGenLib came to limelight as the result of the joint efforts of experienced library professionals and information technology experts from India. So, naturally, the system is influenced by the workflow process in the Indian subcontinent and it is mostly used by some Nigerian academic libraries.

Features of Newgenlib Software

Giri (2015) stated that Newgenlib software has the following features:

1. Android mobile and tablet capable
2. Integration with Twitter helping send messages of transactions directly to users" Twitter accounts.
3. In OPAC, a list of new arrivals can be seen in a user defined period.
4. Flexibility of defining own search field in OPAC.
 5. Enhanced contents, Book jackets and Google preview
6. Zotero compliant OPAC
7. RSS Feeds in OPAC
8. Faceted Browsing (Refining search results).
9. Suggestion for other books in the rack.
10. RFID supports
11. Provision for frequently used predefined templates along with freedom of defining own customized data entry template.
12. Simple spreadsheet -like cataloguing input format.
13. Icons for quick utility tools to merge catalog records, retrieve duplicates, update additional copies, edit catalog records and make a copy of the catalog record, among others.

SOFTWARE FOR UNIVERSITY LIBRARIES (SOUL)

SOUL is an acronym that stands for Software for University Libraries. It is a state-of-the-art integrated library management software designed and developed by the INFLIBNET Centre based on requirements of college and university libraries. It is user friendly software developed to work under client-server environment. The software is compliant to international standards for bibliographic formats, networking and circulation protocols. After a comprehensive study, discussions and deliberations with the senior professionals of the country, the software was designed to automate all house-keeping operations in library. The software is suitable not only for the academic libraries, but also for all types and sizes of libraries, even school libraries. The first version of software i.e. SOUL 1.0 was released during CALIBER 2000. The database of the

SOUL 1.0 is designed on MS-SQL and is compatible with MS SQL Server 7.0 or higher. The latest version of the software i.e. SOUL 2.0 will be released by the end of the year 2008. The database for new version of SOUL is designed for latest versions of MS-SQL and MySQL (or any other popular RDBMS). SOUL 2.0 is compliant to international standards such as MARC 21 bibliographic format, Unicode based Universal Character Sets for multilingual bibliographic records and NCIP 2.0 based protocols for electronic surveillance and control (SOUL user guide, 2000)

Modules

The SOUL 2.0 consists of the following modules. Each module has further been divided into sub modules to cater to its functional requirements: Acquisition, Catalogue, Circulation, OPAC, Serial Control and Administration. SOUL has an in-built network features which allow multiple libraries of the same university to function together as well as access to the distributed databases installed at various university libraries and union catalogue mounted at INFLIBNET using VSAT network. Unfortunately, this software package is new in the Nigerian institutions of higher learning but it is often used in other developed countries (SOUL user guide, 2000)

TINLIB

The term Tinlib means The Information Navigator Library Software (Zaid, 2004). "Tinlib was developed in 1985 by Dr. Peter Noerr, who also founded IME Ltd. (Information Management & Engineering) in London. During the 1980s, the system became widespread, especially in Britain, the United States, and English-speaking countries such as South Africa and Australia. Tinlib later lost market share with the introduction of graphical interfaces like Windows and OPAC. There remained a market for a time in eastern Europe; a Romanian subsidiary, IME Romania, took over Tinlib when IME Ltd. was closed in 2002. IME Romania further developed the system for Tinread" (Wikipedia (2018, np). "Tinlib is a popular library software in Nigeria. Many academic and special libraries have used this particular software to carry out their operations" (Eke, 2009, p.34).

Features of TINLIB

The features of TINLIB according to Zaid (2004, p. 13) are listed as follows:

- Its features include browse and navigate search facilities which allow users to introduce relational data techniques to link information drawn from a number of fields, including author, corporate body and class mark or the thesaurus term.

- TINLIB has "query by search" technique in which it combines searches for different data in a variety of fields into the search. For example, it's easy to search for all titles by one author or publisher and on a specific subject.

- Standard reports for example are available within TINLIB modules and this is considered valuable because it provides useful management information which is almost impossible to obtain from a manual system.

- Outstanding features of TINLIB software is the ability to offer relational structure, full-screen editing, unrestricted fields and records, unique 'navigation" searching, online authority control using window portion of specific files and copy data from the window into the text of the records. The entry input template in TINLIB display a list of field tags on the left-hand side of the screen and search tags names a bibliographic field into which data could be entered easily.

- TINLIB has four modules viz; Cataloguing, Acquisitions, Circulation and Serials. The cataloguing module has seven option menus: Document titles, Author/Editors, etc., Subject/Thesaurus, Publishers/Distributors, Classification, ISBN, ISSN and catalogue – Reports

BRIEF HISTORY OF SOFTWARE USAGE IN NIGERIAN LIBRARIES

According to Kari and Baro (2014), academic libraries in Nigeria started automating their libraries in the 1980s with library management systems. For example, the University of Ibadan Library (Kenneth Dike Library) adopted the CDS/ISIS software that was developed and distributed freely by United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1993 (Ola, 2010). Bozimo (2006) noted that serious automation efforts in Nigerian University Libraries started in the mid-1990s. The author reiterated that Nigeria cashed in on the opportunity presented by the World Bank and organized and executed by the National Universities Commission (NUC) in the 1994-1995 sessions. The NUC donated computers to university libraries in Nigeria and encouraged them to acquire TINLIB library software for their automation projects.

Unfortunately, the software was abandoned due to lack of adequate maintenance support and technical guidance. These libraries have made attempts to use other software including GLAS, X-LIB, VIRTUA and ALICE. Libraries need software that is well supported and used by many other libraries with the hope of forming a user group to support common problems and offer solutions that would lead to continuing improvements (Adekonye, 2011). Today, academic libraries in Nigeria have greater demands for effective library information management systems (Koneru, 2005). Library automation systems today require considerable programming skills together with an extensive knowledge of functional needs and standards. Most automation efforts in Nigerian academic libraries have failed due to lack of feasibility studies and are still searching for appropriate software. Oketunji (2008) pointed out that software selection is not an easy task for libraries. This has given rise to high software turnover in Nigerian library automation projects.

Nigerian libraries have experienced many challenges such as erratic power, inadequate professional librarians to support projects, lack of maintenance and support agreements, poor ICT infrastructures, poor funding and poor ICT skills among library staff (Adeyomoye, 2008; Agboola, 1993; Zaid, 2004; Imo & Igbo, 2011; Kari & Baro, 2014). Another major challenge of library automation in Nigeria has to do with the choice of software. The selection of suitable software packages for libraries became problematic due to lack of good up-to-date comparative studies (Saxena & Scrivastava, 1998). Onohwakpor and Anre (2007) observed that software selection decision in libraries is based on report from other colleagues through conferences. They also noted that some libraries do not do a thorough system needs assessment. The selection of relevant software is an important step in library automation. In the present scenario, a number of library management software packages are being used in Nigerian University Libraries such as KOHA, X – LIB, KOHA, LIB$^+$, SLAM, DSpace, TINLIB, VTLS, ALICE for Windows, VIRTUA, GLAS, E-Lib, Newgenlib, CD-ISIS, amongst others.

However, most Nigerian academic libraries depend on free and donated software. This is due to inadequate funding of educational institutions in Nigeria, it has greatly restricted them to some inferior (not standard) software packages. For example, the University of Ibadan Library started with CDS/ISIS that was developed and distributed freely by UNESCO in 1993. In 1994, the library migrated to TINLIB which was introduced by the World Bank Project in 1994-1995. A study carried out by Idowu and Mabawonku (1999) found that 92.3 per cent of the 13 federal universities studied were using TINLIB for their automation projects, while 15.4 per cent of the universities were using CDS/ISIS. The reason for the preponderance uses of TINLIB was because the NUC made the software available for universities under the World Bank intervention loan package to Nigerian Universities (Bozimo, 2006). This software, according to Doris O. Bozimo, did not carry the universities very far. Ehikhermenor (1990), Zaid (2004) and other scholars attributed the failure rate to a number of reasons: lack of skills by some professional librarians, erratic power outages, occasional system failures, staff attitudes toward automation, inadequate training, shortage of manpower, funding, inadequate finance, poor maintenance of equipment, irregular power supply amongst other challenges. Despite of those identified challenges, library operations cannot be performed manually in this 21st century. In other words, there must be migration from the old arcade traditional library operations to the modern dignified automated operations, the means of doing this is the installation of good software in the library. Bassey (2016, p. 2) submitted that "software packages are relevant in a library that is automated". Thus, library management must carefully select software that that has good features that would efficiently process all the educational resources stocked in the library for her users without much delay.

FEATURES OF STANDARD LIBRARY MANAGEMENT SOFTWARE

There are various features of a standard library management software which should be carefully considered when selecting and acquiring appropriate software for the library operations and services. According to Vsionet (2019) and other scholars, the following features that were

derived from features of most library software packages listed in Table 1 should be considered by the library management before concluding for any software package.

i. Should provide the facility to search any book by the name, title, author and publication;

ii. Each book should contain a unique identification number;

iii. System should able to retrieve all information about the book like when and to whom it was issued;

iv. Provision of limiting the number of books issue to every student;

v. Provision of collecting fines for books from students who submit after due date;

vi. Ensure the system contain bar coding system or RFID (Radio Frequency Identification) system. RFID uses electromagnetic fields to automatically identify and track tags attached to books. There are several ways of identifying tags but the most common is to store a serial number. If RFID system is used then it should contain all tools used in it like tags, RFID reader and RFID gate. The chip and antenna attached together are called an RFID tag. The RFID reader or scanner converts the RFID tag information into digital information which will further seen in computer and stored for future use;

vii. Ensure the system contains bar coding system, then it can read bar codes from the books or cards issued to the students;

viii. Simple, clear interface for librarians and members (patrons);

ix. Various Web 2.0 facilities like tagging and RSS feeds;

x. Union catalog facility;

xi. Customizable search;

xii. Circulation and borrower management;

xiii. Full acquisitions system including budgets and pricing information (including supplier and currency conversion);

xiv. Simple acquisitions system for the smaller library;

xv. Ability to cope with any number of branches, patrons, patron categories, item categories, items, currencies and other data;

xvi. Serials system module for journals, magazines, newspapers and other periodicals that are being acquired in the library;

xvii. User-friendly modules to effectively handle the operations of all sections in the library;

xviii. UNICODE based multilingual support for both local and foreign languages;

xix. Compliant to International Standards such as MARC21, AACR-2, MARCXML;

xx. Compliant to NCIP 2.0 protocol for RFID and other related applications especially for electronic surveillance and self-check-out & check-in;

xxi. Client-server based architecture, user-friendly interface that does not require extensive training;

xxii. Supports multi-platform for bibliographic database such as My SQL, MS-SQL or any other RDBMS;

xxiii. Supports cataloguing of electronic resources such as e-journals, e-books, virtually any type of material;

xxiv. Supports requirements of digital library and facilitate link to full-text articles and other digital objects;

xxv. Support online copy cataloguing from MARC21 supported bibliographic database;

xxvi. Provides default templates for data entry of different type of documents. User can also customize their own data entry templates for different type of documents;

xxvii. Provides freedom to users for generating reports of their choice and format along with template and query parameters;

xxviii. Supports ground-level practical requirements of the libraries such as stock verification, book bank, vigorous maintenance functions, transaction level enhanced security, etc.;

xxix. Provides facility to send reports through e-mail, allows users to save the reports in various formats such as Word, PDF, Excel, MARCXML, etc.;

xxx. Highly versatile and user-friendly OPAC with simple and advanced search. OPAC users can export their search results in to PDF, MS Excel, and MARCXML format;

xxxi. Supports authority files of personal name, corporate body, subject headings and series name;

xxxii. Supports data exchange through ISO-2709 standard;

xxxiii. Provides simple budgeting system and single window operation for all major circulation functions;

xxxiv. Strong region-wise (local) support for maintenance through regional coordinators. Strong online and offline support by e-mail, chat and through dedicated telephone line during office hours; and

xxxv. Available at an affordable cost with strong institutional support.

CRITERIA FOR SOFTWARE SELECTION

It can be observed that "selection of library management software (LMS) is not a simple task. Sometimes librarians go with either renowned software or maximum number of usage of the library" (Reddy & Kumar, 2013, p. 91). However, no matter how good a software package may be projected to be, there is need to closely follow some factors before selecting and installing anyone. According to Srivastava and Saxena (1992), Patel and Bhatt (1996), Adekonye (2011), Gbadamosi (2012, p.5), the following criteria could be considered by the Management of any institution or organization when searching or planning to acquire any appropriate software to manage the educational resources stocked in the library:

User Experiences: A well tested package that is established in the market place, with several applications, is generally to be preferred. The experience(s) of other current or previous users of the software should be sought in order to know the inherent dangers to avoid or manage when using the program in the library. Adequate support for any identified problem should be on ground and ready to assist. In other words, Other people's experiences are useful in indicating the potential and problems or strength and weaknesses of a software package.

Cost: Cost is clearly a consideration, but since, in general you get what you pay for, cost should not be a primary consideration. Software cost may also be a small component of the costs of the entire system, and better software may significantly reduce operating cost. Annual maintenance cost and revised version of the package must be kept in mind at the time of cost consideration, so that it gives compatibility with present and future systems.

Originator: The reputation of the systems houses responsible for writing a software package is important to consider. Experience with other packages from the same originator may be useful in assessing a new package.

Supplier: With specialist software the supplier is often the originator, but with standard business packages there is often an agent acting as supplier. The user may look to the supplier for support and needs to feel confident that this will be forthcoming. The supplier's reputation and history should be considered. Supplier should provide training in the use of the program. Ease of availability of maintenance engineer should be kept in mind. Even though the software package is best, the system sometimes fails without timely and proper customers support in maintenance.

Software language: It is important that the language used to develop the software permits the application to be run efficiently in terms of machine time and storage requirements. The programming language in which the software is written may be a high-level language or assembler or, often, a combination of both. If an application package is written in a particular language, a compiler or interpreter must be available on the system that is to run the package. Or application software language should be compatible with the compiler/interpreter available with the existing hardware system in library.

Technical consideration and compatibility: The software must run under the operating system available in the hardware configuration to be used, and must also be available in a version that is compatible with the hardware. Compatibility is less of a problem that it was once, due to the move towards UNIX based system and extensive use of DOS in microcomputer systems. Multi-user environment is preferred software must be compatible with the hardware available for use and not vice versa.

Ease of Use: The quality of the human computer interface is important for any software package. One must observe how user friendly is the system? It is menu driven (file and functions on the screen for user to choose)? Are the commands and operations easily learned and handled by documentation Staff? Minimum key operations are preferred for change in menus. Software

package must be in a position to cover all libraries in-house functions also few or no changes in library functions according to software are acceptable but not more or all. Similarly, modifications or provisions must be available in the software for new functions or services to be started in future.

Support: Most suppliers or originators offer some support. Good, reliable manuals should be the norm. Other support may take the form of on-site training, off-site training, consultancy, assistance in setting up a system, and a help desk. Some software packages have associated user groups and user group membership may provide a valuable source of information on the package. Both the quality and the cost of these support events must be considered.

Supplied Format: The supplied format is very important for microcomputer system. Software can be supplied on 3 ½ "or 5 ½ "size disks or tapes that can be run on the system and, if necessary, transferred to another medium such as hard disk.

Interface and Integration: Most software packages should be able to export and import data to and from the other packages, of the same kind. Such as between word processing packages and two database packages. Some software will also export data to other kind of packages as from, for instance, a database package to a word processing package e.g. Data from dBase files can be converted to LIBSYS format or database in CDS/ISIS can be converted into dBase format. Software package should support different activities such as word processing, database, graphics and spreadsheets. It is important to be able to reuse data in a system in different formats so a high level of flexibility should be sought.

Retrospective Conversion: Vendor should convert the existing database and should train librarians for import export function.

Documentation: It includes both printed documentation and online help systems. Any reasonable system should have both. Ideally, different kindly of documentation (manuals) should be available for different kinds of user. It should include an introductory explanation of basic features, a full account of all features, a list of commands and an online help system.

Advice in setting up: In addition to tutorial support some assistance in implementing a software package is to be expected. With the larger systems the contract for the purchase of the software will include a number of hours' assistance from suppliers in order to help establish databases, input forms, report forms and other features.

Training: It may be availed from the system supplier or from the training centers licensed by the system supplier. With the larger system both on-site and off-site training is available. Different group of staff should be suitably got trained.

Maintenance: The software package should be appropriately maintained by the supplier. Maintenance involves removing bugs or errors and improving the software so that it incorporates new facilities and concepts. Many software suppliers offer Annual Maintenance Contracts

(AMC) at about 10% of the price of the original package and this entitles users to new releases of the software. Other suppliers offer special discounted rates for upgrades to existing users.

User Group: Many of the larger and some smaller well-established software packages have user clubs or user groups. User clubs are groups of users of software packages that have two main functions: to share expertise and experience in the application of the package between different users; and to discuss and present a concerted front to software suppliers concerning problems and desirable improvements and developments.

Other factors:

- Producer/vendor reputation and reliability base on the performance of previous installations. Software functional flexibility and expandability
- Indexing and searching capabilities
- Interactivity of input and output interfaces
- System security provisions
- Good system documentation and manuals
- Scope of customer training
- Possibility of system upgrading
- Compliance with the Internet facilities

All the above criteria are applicable to the selection of any software package for any organization application and not limited to the library management software package.

PROBLEMS AFFECTING LIBRARY MANAGEMENT SOFTWARE

Library management software is bedeviled with a number of problems, these have greatly affected the effectiveness of the program in the library operations. According to Patel (1994), Zaid (2004, p 64-65), Stein and Kharator (2016), various library software packages are cumbered with the following hurdles:

i. **Financial constraints**: The current downturn in the developing African countries especially Nigerian economy has generally affected the educational sector and libraries are no exceptions. Lots of equipment and manpower are needed for successful automation of library services. Most Nigerian universities and tertiary institutions are greatly under-funded. The Library Development Fund is no more a reality as universities have to depend on the support which the Federal and State Governments can give from the limited resources. Most internally generated revenues are grossly inadequate to sufficiently meet the financial needs of the institution.

ii. **Cost:** Complete library automation is a capital-intensive project. In other words, cost of procuring efficient library software package for the library is too high for smaller libraries to afford as most software packages are foreign based.

iii. **Inadequate manpower training**: Although library Staff are being trained from time to time, however, the training is inadequate as staff needed to always acquire more skills especially on the use of software currently used in the Library. There should be continuous training and retraining. Most engaged staff in the ICT unit of the library are not well trained to handle some complex cases that would arise before and during the installation of the software package.

iv. **Lack technical expert for software maintenance**: Software maintenance is often neglected by libraries. This is done by not knowing how to correct some errors that occur in the software. This has been a major problem which made most libraries to discontinue using the installed software and later change to another ones, invariably, this has cost much fortune to the libraries to handle with their meagre funds. Most software packages developers were foreign-based and bringing them to resolve any software issue will cost much money, this would affect their usage.

v. **Lack of actionable Policy**: Most libraries have no stated policy to support the selection, installation and management of software package.

vi. Inadequate government support especially to the State-owned institutions.

vii. **Shortage of manpower**: This has been a major problem affecting the successful automation of most Nigerian Libraries. Full library automation requires a large number of qualified staff participants specially to input data to really make it a success and to process such in order to meet the information needs of the library users.

viii. **Lack of skill by some professional librarians**: Automation requires that those who are going to operate the electronic systems possess a certain level of knowledge and skill to be effective in the expectation of what automation has to offer. Majority of librarians are trained in the traditional methods of librarianship. Though information technology, automation of library service is included in the module in library schools but these are not taught effectively. Information technology is the language of the 21st century. Thus, librarians need to continuously update their skills to be able to function maximally in an IT environment.

ix. **Irrational Electricity Power Outage**: The nation for the past few years has been experiencing power outage, of recent, the Federal Government of Nigeria in order to

improve the rate of electricity generation in the country, changed the name from National Electricity Power Authority (NEPA) to Power Holding Company, unfortunately, all to no avail as nothing change positively rather the electricity generation in the country is becoming worst. There had been problem with the generation and distribution of electricity by Power Holding Company (PHC). Most Universities has a central generating plant and a standby generator, these help to reduce the problem of power outage but they the cost of maintaining them is high.

x. **Occasional system failure**: The system occasionally breaks down and would be out of use for few days before the consultants come to rectify the faults. The time lag usually affects the input of data into the computer system – in process as data entry will be stopped. It would not have been necessary waiting for the consultants if staff had the competence especially on the software used.

xi. **Staff Attitude towards automation**: Many staff shy away from electronic systems with the fear of damaging or deleting important information while keying-in, this slows down the automation processing. University of Lagos Library management had addressed the problem by putting a PC on every librarian's table and embarked on training them on the use of it.

xii. **Lack of proper planning**: Planning of library automation will involve proper feasibility study of the project to avoid waste of time, money, energy and to ensure the success of the project. In spite of its inherent benefits, library automation is a capital-intensive venture. This is because of the high cost associated with computer hardware and software. No project can succeed without a prior feasibility study. The adoption of any automation system in the library should be based on a wide range feasibility study, which will determine the adequacy of the programme. In light of the fact that there are now new hardware and software used for library automation it becomes imperative for institutions to determine whether they have adequate sources of resources to operate library automation. Unless this is done, there are bound to be problems here and there. A proper planning for library automation must include: Objective of library, Library finance and budget, System analysis, Identification of main area of library automation, Sources of data/Standard format Z39.50, MARC, RDF etc., Hardware requirement, and Software for library automation: commercial or open-source software (Mishra, Thakur & Singh, 2015, p. 12).

xiii. **Inadequate Design of the Software**: Some features/modules of the software may not work properly in most of the academic libraries where they were installed.

xiv. **Incessant Virus Attack**: Most times, virus attacks the software. Some libraries are prone to virus attack, this makes computer system and the installed software to often break down. In such situations, the system may be hanging, or some modules in the software may not work properly.

xv. **Wrong Choice of software:** In his study carried on the use of Micro CDS/ISIS in Pakistan, Mahmood (1998) listed the problems in the utilization of CDS/ISIS as: installation errors, system hangs, abnormal termination, data corrupted, inverted file removed, errors in invented file generation, incorrect search results, errors in printing/sorting, and backup errors.

xvi. Inadequate Internet and Mobile Network Connectivity
xvii. Networking and Resource Sharing

The Way Forward

It can be observed that no library management software is devoid of one problem or the other, but such has to be minimized, managed or checked by the Authorities concern in order to achieve their expected objectives in installing the selected software for their library operations. According to Amando et al (2018), the following solutions could be proffered as the way forward out of the identified challenges affecting the effective operations of the library software in the Nigerian libraries:

i. Workshops should be organized for members of staff to sensitize them on the importance of Library management system.
ii. The library should be encouraged to form a software user group to intercept problems as they arise.
iii. Internet Access- the library should be able to provide its own internet access domiciled in the library and independent of what it gets from the ICT directorate. In other words, library should have adequate internet and mobile network connectivity
iv. Library staff should be encouraged to explore new technologies.
v. All modules of library software should be in use.
vi. There should regular electricity power supply for the library computer system. There should be installation of generating set for the library.
vii. Training and re-training of library staff and users should be done regularly.
viii. Complete library automation is a capital-intensive project. For this reason, libraries should form acquisition consortium by putting their financial resources together in procuring the efficient library management software for each participating library.
ix. It could be observed staff in most libraries have negative towards LMS and the library automation. It is imperative for library staff to have positive attitudes towards library automation, gone are the years when library services were operated manually. Library

operations and services should be digitalized as these would facilitate our services to our esteemed clienteles.

x. Libraries should have well stated and implemented policy to support the selection, installation and management of software packages.

xi. Each computer system slated for the library automation, should equally be installed with powerful anti-virus software packages, these would enable them to tackle the menace of incessant system virus attack.

xii. There should proper planning of library automation that should involve proper feasibility study of the project to avoid waste of time, money, energy and to ensure the success of the project.

xiii. Adequate funds should be made available for the acquisition and maintenance of related

library management software and its packages.

xiv. Technical expert should be employed for regular maintenance of the computer hardware and its accessories, this would prevent the collapse of the library digitalization programmes.

xviii. There should be adequate government support especially to the State-owned institutions.

CONCLUSION

It could be revealed from the above Table1, there are so many software packages that had been developed and are being developed to enhance the library operations in this 21st century. This could bring confusion as to which one to acquire, the Library Management Committee has to be careful when scouting for any suitable software package, the most credible software package that would adequately meet the information needs of their libraries should be considered or selected. Those selecting criteria identified in this book could be of help. Also, it could be deduced from our discussion that library operations could no longer be done manually in this 21st century librarianship, hence, there is need for the installation of the most efficient, cost effective and user-friendly library software package. Librarians and other library personnel should be trained and re-trained to enhance their efficiency and effectively handle the selected and procured library software package.

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