Automation of Academic Libraries and Web Development: A Reverie or Reality

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ABSTRACT

The intricacies of web development have orchestrated a paradigm shift in academic libraries. The study explored literature on the status of automation of academic libraries and web development in Nigeria. It was established that the functions of library management software are abysmally under-utilized in academic libraries in Nigeria, thus, progression of automation projects remain a swinging pendulum. The paper, therefore, recommends that librarians should acquire the relevant training and plan strategically for all automation projects aimed at incorporating the intricacies of the web and ICTs into library services to fully utilize the functions of the library management systems in line with web developmental stages, thus, be able to compete globally.

1. Introduction

One obvious lesson history has taught mankind is that the bane of ignorance is severe developmental retardation which has direct bearing on the amount of information available and accessible for such developmental drive. To this end, in the 21st century, information has become a vital survival resource alongside other basic natural resources such as oxygen, labour, water, land, and capital. In such dispensation, librarians have been positioned to constantly redefine their roles towards ensuring the provision of quality, current, and timely information resources and services that is not limited to the boundaries of bricks and mortar through the process of automation. Automation process entails the integration and application of the intricacies of Information Communication Technologies (ICT's) into the work activities and routine duties of information business.

Library automation according to Deshpande (2013) is a generic term for information and communication technologies that are adapted to compliment or supersede manual systems in the library. The automation of libraries accrued many benefits such as easy and speedy access to online resources, accurate, and faster completion of library routine tasks. The process of library automation in Nigeria is more pronounced in academic libraries mainly because Muogehin (1996) described the university

library as 'the heart of the university'. In view of this, Ajala (1997) explained that the great flood of information and the need to avoid keeping backlog of unprocessed materials, as well as the need to make information accessible to researchers in remote site and satellite campuses of the universities have necessitated new and faster techniques of processing information. Other reasons include the need for global visibility of research results and bridging the communication gap between researchers from developed and developing countries. Although most libraries in developed economies have developed fully integrated computer systems, however, in the developing countries, there are cases of partial, abandoned projects, or non-functional automation projects.

The functions and uses of ICT components for automation projects are in consonant with web development, from web 1.0, 2.0, to 3.0 and even the prospective web 4 .0. The hallmark in each of the stages of web development is the improved features it introduces to the functions, managements, activities of the system. The era of web 1.0 ushered in the concept and idea of the modern library otherwise known as library 1.0. Information services then witnessed a paradigm shift that birthed the modern-day library. However, the proliferation of ICT tools into information services was promulgated by web 2.0. This led to a more 'democratic' information services that is interactive, user-centered, collaborative, content rich, and social in nature. The content of web 2.0 and library 2.0 utilized social media platforms such as Wikis, Blogs, RSS Feeds, FAQ, instant messaging, websites, social networks and web-based software for its deliverables. The library, thus, have been at 3.0 and prospecting 4.0.

Based on the above, it therefore, supposes that the automation process in academic libraries should meet up with the demands of the web development stages. Okoroma (2010) asserts that in Nigeria, few libraries have converted some aspect of library services to varying degrees of automation. Horsfall and Fagbemi (2015) opined that the automation of libraries in Nigeria continues to progress daily but are marred by a lot of challenges. It, therefore, means that libraries in Nigeria are yet to attain full automated status because only a few aspects of the library services have remained in partial automation state as they are unable to utilize fully important features of each of the stages of automation project. Based on the foregoing, this study sets to assess the status, challenges, and prospects of web development and library automation in Nigeria.

2. Literature Review

The paradigm shift in the philosophy of information service provision and delivery which is user oriented has more than ever necessitated the adaptation of information communication technologies into library services. Hence, automation processes in libraries. According to Kent (1977), automation involves the use of technology in the design and development of processes and systems that minimizes the necessity of human intervention in operations. Therefore, library automation sums all the efforts directed towards the utilization of computers and networking technologies in the library. Kwanya et al. (2015) explained that ICTs has transformed the world to a 'global college' where networking has created interconnectivity possibility beyond the limits of geographical boundaries, consequently, users can create and access information at the click of the button. Thus, automated process becomes cost-effective in serving the many library users across the globe.

A number of studies have reported that serious application of information technology to library processes started in Nigerian university libraries in the early 1990s (Awogbami, 1992; Lawani, Azubike & Ibekwe, 1992; Mosuro, 1996; Idowu & Mabawonku, 1999; Ogunleye, 1997; Agboola, 2000; Ajala, 2001; Nok, 2006). In another account, Ajidahun (2005) asserts that the early noticeable automation debut in Nigeria was recorded at Nnamdi Azikiwe Library, University of Nigeria Nssukka in 1977. This led to the argument and counter-argument for and against the automation of University of Lagos Library in 1980. Consequently, the automation project was started in 1982 in the University of Lagos, leading to the subsequent commencement of automation projects in other university libraries in Nigeria.

The automation project plan in most Nigerian Universities was designed as a gradual and continuing process, and ever since, the application of IT has gradually taken firm root in some Nigerian university libraries. However, most Nigerian University libraries started automation in cataloguing unit, and still, currently, more automation attention is centred on the cataloguing section of most academic libraries. This position was noted by Adegbore (2010) that the main area of focus in automation in Nigerian university libraries is cataloguing. Consequently, this section has been enjoying greater attention as compared to other sections such as circulation, serials, reference, and acquisition.

Even though most librarians have embraced the automation of libraries for efficiency and effectiveness, the continuous development of the automation process in line with the development of web and proliferation of Information and Communication Technologies remains elusive. Adegbore (2010) asserts that the automation process is often uncertain and in an unpredictable pattern. He further explained that the present automation project plans in various university libraries are defective and unrealistic. They appear to be too long to be achievable, too flexible and devoid of serious policy statement, and implementation plan, coupled with gross absent of documentation of automation activities, hence, their progress remains epileptic − neither moving forward nor maintaining the already standing process (Adegbore, 2010). However, despite the situation expressed, library automation remains the reality of 21st century in service delivery. On this note, Abbas (2014) opined that any library that ignores its capability in transforming the information environment is at risk of losing ground. It is based on this premise that this paper understudies the automation phases of academic libraries with objectives on the status, challenges, and prospects.

2.1 Library automation and web development in academic libraries

Automation of library services is applicable to a wide range of operations in academic libraries. This has brought many changes and maximum efficiency to information provision and service delivery. The automation process involves many components of ICTs as elucidated by Abbas (2014) as;

   a. computer technology
   b. Telecommunication technology
   c. Broadcasting technology
   d. Microelectronic/micrographic technology
   e. Reprographic technology.

These components are assembled to achieve automated services, without anyone of them, automation could not be said to be complete. With the proliferation of these ICTs and the development of web, industries/businesses are adapting the new inventions to stay abreast with the change in order to increase efficiency. As the web develops, it comes with wide arrays of ICTs equipment and services. Consequently, Ajidahun (2010) asserts that;

> the emerging global trend in information technology and its incontestable relevance to the information
> retrieval systems have decisively propelled and compelled libraries worldwide to critically consider
> the information technologies in order to enhance provision of efficient services and improve productivity.

The development of the web comes in stages, the first stage of the worldwide web was dubbed web 1.0. According to Cormode and Krishnamurthy (2008) "content creators were few in web 1.0 with vast majority of users simply acting as consumers of content." This translates that, the web 1.0 was simply an information arena where audience passively receives information without the possibility of a feedback. Berners-Lee (1998) considers the web as read-only Web, meanwhile, Sarode stated that web 1.0 provides very little interaction for exchange of information and no interaction with the website. The role of the web was very passive in nature. This suggests that the web 1.0 does not give room for constructive interaction, it is linear in nature and interactive model of communication does not exist therein. The major ICTs for this stage consist mainly of portals, computers, network facilities, and printers. Automation projects in Academic libraries in Nigeria have all embraced automation of services, and acquired computers, and their own portals for information display.

Consequently, in his historical perspective review of automation in Nigerian Universities, Ajidahun (2010) cited Adeyemi (2001) saying, "advances in the field of technologies over the years have expanded the frontiers of new information technologies applicable to library operations beyond the computer." Abbas (2014) reported that the use of computer in library services and its application has brought maximum efficiency to services of libraries through increased reductions of mistakes, increase in convenience, adequate statistical data keeping, control literature growths, labour saving and easy exchange of documentation. Several authors have opined that academic libraries in Nigeria perceived automation as advantageous to library operations and not threat. They are, therefore embracing automation with efforts geared at steadily and systematically converting from manual to electronic routines in their libraries (Adegbore, 2010; Ajidahun, 2010; Agboola & Salaam, 2002; Salaam, 2003; Fatoki, 2004).

With advancement in technologies and the web, the web 1.0 metamorphosed into web 2.0. Web 2.0 in the words of Moseid (2008) "is a trend in www-technology and web design, a second generation of web-based communities and hosted services which aims to facilitate creativity, information sharing, and collaboration and user participation." She emphasized that web 2.0 defeats the linear communication pattern characteristic of library 1.0. Berners-Lee (1998) described web 2.0 as a read-write web. The technologies of web 2.0 allow assembling and managing large global crowds with common interests in social interactions. These are the various technologies of communications which according to Singh, Bebi, and Gulati (2011) are blogs, wikis, RSS feeds, peer-to-peer sharing platforms, social

networks, widgets, applications, media sharing, iPod and video on-demand (VOD) casts, mash-ups (hybrid applications which mix various forms of data) and folkonomies (bookmarking/content sharing sites). These are the product applications or second group of technologies of the stage, that combines the web features and allow for interactions or feedback, as opposed to the web 1.0 which does not allow for interaction or feedback. Web 2.0 could be seen as the democratization of collection of knowledge production, social networking and user to user information exchanges, it is commonly associated with web applications that aid interactive information sharing, interoperability, user-centered design, and connection on the World Wide Web.

Thus, the introduction of web 2.0 created a paradigm shift in library philosophy from content focus to client-centered services. Emasealu and Umeozor (2016) explained that this was a problem because of the shift in library philosophy from ownership of locally stored resources to provision of access to electronically stored resources to serve the many users of social networking media. Consequently, this approach requires that libraries and librarians must now operate on social media platform.

The innovations and effects of social media on information generation and sharing is not uncommon to academic librarians in Nigeria, however, the full adaptation of these media into the mainstream of library services is yet pronounced as it should in this dispensation. In support of this view, Emasealu and Umeozor (2018) observed that:

> over the last few years, it has become apparent that social media has captured the fancy of most
> people. The extensive use of social media has drastically changed the way people communicate and
> share information. The proliferation of these communication technologies presents a competitive advantage
> for librarians to key in and keep abreast of the development in the information industry.

The above suggests that librarians are yet to fully key into the use of social media in the information business in Nigeria. No doubt, some libraries offer social media services, however, they are usually underutilized as required of an automated library. Therefore, academic libraries in Nigeria are yet to be fully library 2.0 compliance.

The advancement of technologies of communication and their uses transpired into web 3.0. The Basic idea of 3.0 is to define structure data and link them in order to be more effective discovery, automation, integration, and reuse across various applications (Ossi, 2003). Singh, Bebi, and Gulati (2011) assert that the features of web 3.0 include transforming the Web into a database, a move towards making content accessible by multiple non-browser applications, the leveraging of artificial intelligence technologies, the Semantic web, the Geospatial Web, or the 3D web.

Library 3.0 according to Bhattacharya (2016) is a model for libraries using technologies such as the semantic web, cloud computing, mobile devices and re-envisioning our use of established technologies to make library collections accessible. This means that it is a library service engineered to use individual information search and use behaviour through technologies to design library services that are suited to individual needs. The end result of Library 3.0 is a library with services not defined by the boundary of bricks and mortar, but where collections and services can be made readily available to library users regardless of their physical location. It is a virtual complement

to the physical library. Academic libraries in Nigeria in their bid to attain borderless library services, have initiated library consortium, open repository services, and subscription to various databases. Despite the challenges therein, studies revealed that academic libraries in Nigeria subscribes to databases and this has recorded high use percentage (Emasealu & Umeozor, 2018; Edem & Egeb, 2016; Alhassan & Macaulay 2015; Lwoga et al., 2007). However, other important aspects such as personalised services according information use behaviour and personal content creation are lacking and sometimes absent.

3. Automation of Academic Libraries and Web Development:

3.1 Challenges of library automation

The challenges of library automation in Nigeria are myrid, these challenges are identified with the major ICT components are shown in table one.

Table 1. Challenges of library automation

Challenge	Factors
Computer technology problem	Hardware breakdown Unreliable and epileptic power supply Lack of maintenance schedule Power failure Inadequate funding
Telecommunication technology problem	Inadequate funding Low internet bandwidth Poor internet connection
Broadcasting technology problem (online content display and accessibility)	Inadequate funding Lack of expertise experience Low internet bandwidth Poor internet connection
Management (Human factored) and sustainability problem	Lack of technical knowledge Lack of project policy Poor feasibility study Poor documentation Manpower problem Staff training deficiency Lack of staff commitment Obsolescence of commercial software
Microelectronic/micrographic technology problem	Inadequate funding Lack of technical knowledge
Reprographic technology problem	Lack of technical knowledge

3.2 The reality of automation project in academic libraries

As the web develops further, technologies of information are changing and advancing on regular intervals, bringing new innovations in service delivery, which has made most automation projects a tasking one. Automation project in libraries entails the shift from human labour to computerized

one, controlled by set of computer command programmes known as management software. The automation project consists of system software and application software. System software is the management package which consist of set of control command and programmes such as operating system and management software, for managing the library, while the application software consists of computer applications for accomplishing computer-related tasks such as word processing applications, and graphic design applications among others. University libraries in Nigeria according to Baro (2014) started dedicated acquisition of computers and related ICT's for automated services with the donation of computers from National University Commission (NUC) between 1995 and 1999. Subscription to library management software was equally initiated almost at the same period. Software were selected based on the perceived effectiveness according to the three qualities of a good management software; which, according to Obajemu et al. (2013) are operation (correctness, usability, integrity, efficiency, reliability, security, and safety), Transition (usability, portability, and transferability), and revision (maintainability, testability, flexibility, extensibility, scalability, and modularity). It is, therefore, expected that the selection of any management software would hinge on one that will perform effectively with little or no hiccups, as wrong choice of software will have debilitating effects on service rendition. Traditionally, the choice of a management software was based on the three qualities stated above, however, the evolution of the World Wide Web and the need to render services in term with the demand of users according to the functions of the web influenced the choice of a software. Among the management software being used in some academic libraries are CDS/ISIS, Integrated Management System, KOHA, ADLIB, E-Print, DSPACE, GLAS, SLAM, VIRTUA, TINLIB, and ALICE. Several authors assert that KOHA, SLAM and VIRTUA library management software are more prominent than others in Nigeria (Baro, 2014; Okpe & Unegbu, 2013; Obajemu et al., 2013; Omeluzor et al., 2012).

3.3 Utilization of management software in Nigerian Libraries.

The development of library management system was steered up by the growing community of libraries to achieve their technology goals. The features of the prominent library management system software (KOHA, SLAM, and VIRTUA) include open source integrated library system, on-line public catalogue, acquisition, cataloguing, serials and report module, web based, Linux, Unix, Windows and MAC OS' platform, copy cataloguing and Z39.50, MARC 21 and UNIMARC, use as document manager, manage online and offline resources, e-mail, overdue and other notices, multi-tasking, and full library services modules. However, they required computer knowledge for smooth use. Obajemu and Ibegwam (2006), made it clear that every information provider should have knowledge in general computing and be proficient in the Library Software introduced into the library. The authors further stressed that the information providers should be able to accomplish the followings tasks - turn on the computer and call up information, complete the necessary fields using all facilities (input data), verify/revise records, store records (save) and proceed to input others and to print records where necessary. The facilities for the smooth take-off of library automation need to be put in place and such facilities include computer systems, cabling, bandwidth, computer printers, telephone, internet, and scanning machine. However, for overall effectiveness of the automation

process, computer experts such as programmers, programme analysts, web designers, and web managers among others are needed to be able to execute the tasks.

In Nigerian academic libraries, the full library modules of the management software are under-utilized. The software prominent among Nigerian academic libraries have the capacity for acquisition, cataloguing, serial, reference, and report module. There has been the migration from one library software management system to another for progressive and better automated services. However, the automation projects are focused mainly on cataloguing aspect. Adegbore (2010) maintained that the main area of focus in automation in Nigerian university libraries is cataloguing. As such, this section enjoys greater attention as compared to other sections such as circulation, serials, reference, and acquisition.

There is, also, such services as online reference, e-mail, and overdue notices available through these management software, such services have not been utilization since the migration from one library management software to another. In fact, online-reference popularly known as e-reference is the crux of library automation, expected to guide user on information search and retrieval; which is part of the primary purpose of academic libraries − acquisition, processing, storage, retrieval, and dissemination of information. Although, e-reference does not replace the traditional desk reference services, it does provide such services to patrons in remote locations. This is a service visibly absent from the automated services rendered by most academic libraries in Nigeria. According to Anunobi and Ogbonna (2012) advances in web development unveiled a move from the static web to a platform where users are opportune to interact with the web through the creation, deleting or remixing of content. Libraries in developed world boast of utilizing web 3.0, and yet, Nigerian academic libraries swing between varied functions of each web stage. In information business, communication is very vital, the world as a global college depend on information shared through remote channels such as e-mail, social networking sites, website, social media etc (which are component of web 2.0). Aside e-reference, these tools can be utilized in various means in the library such as sensitization, notice on new arrival, mass-education, open sources, selective dissemination of information, publicity, inter-librarianship, among others.

Studies are replete on the awareness and use of web 2.0 by librarians especially in developing world (Anunobi and Ogbonna, 2012). Awareness however, does not suggest use. It is, therefore, a daydream for libraries who cannot utilize the communication tools of web 2.0 in services rendition to prospect further automation processes. Anunobi and Ogbonna (2012) reported that only 24% of the librarians used social networking sites. The authors explained very low use of blogs and wikis (7%) VOIP tools (6%), Image/Video sharing tools (47%) and aggregating tools (4%). Apart from Youtube (10%) and Blogger (14%), none of the individual web 2.0 tools have up to 10% of librarians using them. This portrays the abysmally low usage of the Web 2.0 tools except for Facebook.

More so, there is lack of technical skills to manage and give meaningful command to the management system effectively. Although the services are automated, they are being carried out by machines and computers that depend on human beings to give the command/instruction. Aharony (2009) attributed the issues facing library automation as basing on personality characteristics (resistance to change), computer expertise (skill), motivation (resistance opportunity for use), importance and capacity towards studying and integrating different applications of ICT by library staff. Ashcroft

and Wetts (2005) described this as lack of competencies. It therefore, supposed that developing countries are plagued by lack of technical skills. For instance, without this skill, there will be a number of errors in the selection of a management software, maintenance of ICT hardware, developing programme for services, adopting strategic services for patron, developing automated service policy among others. There is massive development in terms of hardware acquisition as reported by Obajemu and Ibegwam (2006), that there is a considerable amount of ICT facility in Nigerian academic libraries. Consequently, lack of technical knowledge by library staff constitute a major clog in the wheel of effective automated services in academic libraries in developing countries. University libraries in Nigeria do not have experience with state-of-the-art library technology (The Mortenson Center for International Library Programs, 2012). They also reported that this is because training has not been consistently available, as well as technical skills vary and are hard to keep-up-to-date. While this could be attributed to lack of capacity development in most of these institutions, Atilomah and Onuoha (2011), also presented the factor of Laissez‑faire attitude of information professionals to acquiring the requisite skill in the ICT dispensation.

From the foregoing, it is observed that academic libraries in Nigeria are making frantic effort by embracing computerization of libraries to attain automated status, however, these efforts are not wholistic because the migration from a phase to another in automation should be necessitated by a 'need' – need of users, need to meet up with the developmental phase, need to render best services, among others. It, therefore, requires that the functions and features of any phase should be fully utilized before migrating to other higher versions. And this is clearly not the scenario in academic libraries in Nigeria, until this becomes the case, the adequate automation of academic libraries in compliance with web development in Nigeria remains a reverie.

4. Discussion

4.1 The way forward

Effort are being made daily to improve on automated nature of academic libraries in Nigeria. Evidently, the situation remains unchanging. Studies have suggested the over-coming of these situations through capacity building of all librarians and other library employees. This is because the human resources of every organisation determine the extent of effectiveness of the machine of operations. There are the challenges that accrued from computer/hardware, telecommunication technologies, and management and sustainability, all trickles down to the technical skills of the personnel that has daily interaction with the system. In effect, the study proposes library personnel development through routine training and retraining of librarians.

4.2 Library personnel development

Training and retraining is an important crux towards development of personnel of an organisation in the modern world. In the modern world of today, knowledge is power. Thus, the library as

the source of this power is not left out. Anyaoku (2012) assert that technology adoption by libraries has moved from the early stage of automating selected library operations to the stage where ICT have permeated into almost all spheres of library services and routines. This she explained as a huge responsibility that requires additional skills from librarians of the 21st century. Emasealu and Umeozor (2016) emphasized the emergence of technologies as the reason for which even more training and retraining is necessary for all concerned. The authors opined evidently, that the rate of decline in services in most libraries today, trickles down to limited investment in the training and developing of library personnel. With this awareness, they concluded that managing the system of information and communication in the library necessitates the continuous acquisition of new skills to accommodate latest development in librarianship. Over time, studies successively recommend funding, installation of LAN, stable power supply, provision of policy statement, and provision of bigger internet bandwidth among others, as the possible means to improve automated services in libraries (Omeluzor et al., 2012; Okpe & Unegbu, 2013; Baro, 2014; Otunla, 2016; Takappa & Ramakrishna, 2017; Athanasius, 2018). No doubt, these may have their significant input but without the basic and professional expertise as how to coordinate all these wonder tools into one towards best service rendition, they are as good as not being available. To this end, availability cannot equate functionality.

Continuous staff training and development in the library are activities that can make a profound contribution to the overall effectiveness and efficiency of the automation services in the library. It is evidently believed that with the necessary skill-set needed to effectively and fully utilize the functions of the library management software in line with web development, automation process in Nigerian academic libraries will stand to compete with best practices of library automated services in the world, thus, a reality.

4.3 Prospects of library automation in Nigerian libraries

According to Bhattacharya (2016), the original web was about browsing contents, 2.0 is about uploading contents and 3.0 is about developing services that have the capability to merge separated uploads into more elaborated pieces of contents. All these put together afford libraries unique prospects as follows:

- **Unlimited content**

Library automation allows for flexibility in inter-librarianship, this aid in cross-accessibility for users. This affords users from different locations access to variety of materials that are of quality, and are reliable, since these materials are in the inter-connected libraries and their collections easily accessed without difficulties. Hence, collections are unlimited and yet well maintained, checked and streamlined.

- **Virtual reference service**

In the era of many information explosion caused by the production and share of information at the speed of light, libraries remain the precursors of authenticated and verifiable information

resource. Therefore, this requires that the traditional role of reference librarians of waiting to guide library users to the appropriate information resource has evolved to seeking out numerous information users who feel self-sufficient in searching and retrieving information for use. The numerous and still emerging features in existing ICTs offer the reference librarians opportunities to transform the reference services to a 21st century reference service through the use of chats, personal messages, and selective communication and information among others to reach users.

- **Cloud librarianship**

Physical collection and display of information resources is faced with the problem of location, space, and storage. It therefore, may not be very effective in a time of boundless information resources. The web beyond spaces, offers timely and borderless services. The term cloud librarianship denotes a revolutionary shift from ownership and operation of local servers to web based collection and services. Although, the essence of physical library cannot be entirely written off, the emphasis on physical collections and services will reduce drastically in years to come. Starr (2011) in her report "*The librarian in the cloud: or beware of unintended consequences*" expressed that the physical bank of her memory filled with bankers, and people on the banking hall had evolved into ATMs, tellers, and bankers who work on web in a backroom somewhere out of public sight, yet there is still something called banking. The web aids in enhancing virtual library services in areas as content collection, repository services, e-reference, OPAC, and cataloguing among others. Consequently, Starr (2011) asserts that the exponential development of ICTs will accelerate the obsolete of physical collections in the near future. It appears that the new library, as an organization, will have librarians "behind the wall" and collections "in the cloud."

5. Conclusion

Information in the 21st century is a vital survival package. The intricacies of the web and ICTs have redefined the traditional routine of information business. Academic libraries therefore, have adapted the technologies of information to remain relevant in the information business and provide quality services not bounded by geographical boundaries. The process of library automation is being utilized to replace manual operations in the library. The development of web influences the automation services. Although, the application of IT is gradually taking firm root in Nigerian university libraries, most Nigerian University libraries started automation on cataloguing unit, and currently, more automation attention is centred on cataloguing section of the academic libraries. The automation of academic libraries in connection with web development showed that academic libraries have fully incorporated the technologies of web 1.0, but partial implementation of web 2.0 and 3.0 into the library services and therefore, could be said to be a swinging pendulum between the library 2.0 and 3.0. The paper also identified the challenges of automation in Nigerian academic libraries and concludes that the technologies associated with the web stages joined together would afford libraries unique prospects such as unlimited content/collection, improved virtual reference services and cloud librarianship. It was established that automation of academic libraries in Nigeria are yet to fully

utilize the functions available in the library management software made available through advancement in web development. The paper therefore, recommends that librarians should acquire the required training and plan strategically for automation projects aimed at incorporating the intricacies of the web and ICTs into library services to make the automated services in academic libraries a reality.

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