

## LEVERAGING EMERGING TECHNOLOGY FOR PUBLIC LIBRARY SERVICE IN NIGERIA

BY

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### **Abstract**

*Emerging technologies (ET) for library services abound. Emerging technology comprise of technological tools that facilitate user services, instruction, library management and technical services. The emergence of these technologies has provided libraries across the globe great opportunities to enhance provision of library and information services to their users. Many libraries particularly of the developed countries have been providing library and information services through the use of ET such as computer, RFID and communication technologies. Public libraries in Nigeria should not be an exception in embracing and utilizing these technologies in order to serve their users in a more efficient and effective ways. Through the review of available literature, this paper seeks to identify various types of ET for libraries and their uses in public library services. It also explores Public libraries in Nigeria, opportunities for adoption and the challenges public libraries are likely to face towards the utilization of ET. The paper concludes with some vital recommendations.*

**Keywords: Emerging technologies, Public libraries, Opportunities, and Challenges**

### **Introduction**

Libraries had been in existence as far back as the ancient times, although they were not the same as present day libraries. The long existence and the changes libraries experienced over time had never distorted their traditional roles of information acquisition, organization and dissemination. Today's libraries acquire and keep information in various formats as well as provide information services with the aid of computers, internet and other information and communication technology (ICT) facilities (Iwhiwhu, & Okorodudu, 2012; Jantti, 2016). Public libraries provide access to their collections to members of their communities pursuing personal, social and public minded goals free of charge (National Research Council, 2000; American Library Association, 2020). Public libraries perform and provide wide range of activities that promote reading, learning and research among members of their communities. International Federation of Library Associations and Institutions IFLA (2001) refers today's libraries as avenues where resources are kept in a variety of formats that are well organized by professionals for the purpose of educating, informing and entertaining as well as stimulating individual learning and advancing society as a whole. Summarily, public libraries acquire, organize and disseminate information resources in various formats for the purpose of advancing learning and research activities of members of their communities.

Information resources, the lifeline of libraries and the library users are becoming very complex. Information resources are now available in various formats due to technological advancement. They exist not only in print but also in electronic format. Some electronic books are not only in audio forms but in multimedia form with interactive properties (National Academy of Sciences, 2000). Public libraries cannot shy away from books in these formats, "Many of them are scholarly in nature, intended for research, and undergo the peer-review process before

publication. Other books are a source of popular information meant to entertain or inform rather than provide a citable source. (Information Foundations)” Library is witnessing new set of users commonly referred as “digital natives” whose information usage and information search behavior entirely differs with older generation library users. According to Zimmerman (2012) “Digital natives are different in their search behavior, preferring to use web-based search engines such as Google, Yahoo and Bing.”

The ongoing changes in the world of information and information consumers make it imperative for public libraries to adjust their approaches to resources acquisition and library services in order to remain relevant. ET comprise of artificial intelligence (AI), biotechnologies, computer technologies, digital technologies, genetics, information technology, medicine, nanotechnology, networking technologies, telecommunications, web technologies, and so on (Li, 2009). ET are necessary tools that public libraries should embrace to enable them serve their users better, in a modern way. The objective of this paper therefore, is to assesses the state of public libraries in Nigeria, identify ET available for Nigerian public libraries, opportunities for adoption and possible challenges for further use of ET by the public libraries in Nigeria.

### **Nigerian Public Libraries**

Public libraries had been in existence in Nigeria as far back as the early years of twentieth century. The Tom Jones Library in Lagos and the Lagos Library established between 1910 and 1930s had some elements of public library. The colonial government established reading rooms across the Nigerian regions, most of them metamorphosed into public libraries in the country. The growth and development of public libraries in Nigeria were facilitated by Ibadan seminar of 1953. The seminar was organized jointly by the Nigerian Government and the United Nations Educational, Scientific and Cultural Organization (UNESCO). Eventually, public libraries were available in all the three Nigerian regions before the country’s independent. States’ public libraries were established in the new states following the dissolution of the regions (Olden, 1985).

Studies had reported the existence of public libraries in most part of the country offering varying degrees of services (Fuegi, Segbert-Elbert, & Lipeikaite, 2011). Although most of these libraries were small with limited space, resources and lack technology related facilities, yet they provided the traditional library services such as book lending. Despite the growth of public libraries in Nigeria from few numbers to hundreds, the availability of ICT facilities and other emerging technologies is lamentable. Only few libraries have ICT such as computer and internet service. Ariole (2017); Bassey (2018) have reported the availability of few computers in the public libraries of South West, South-South and South East geo-political zones. This paper attempts to fill the gap, exposing public libraries to the opportunities of emerging technologies.

### **Emerging Technologies for Nigerian Public Libraries**

Today, we are witnessing a world of emerging technologies (ET). ET have affected all spheres of our lives, ranging from office work, bank transactions, industries’ operations, educational systems, training, business, health care, security, transportation systems to housekeeping. Library being an integral part of our community, it is equally affected by this technological revolution. The concept of a library as physical place where one can visit to get information is rapidly changing to

a social cyberspace where users access, communicate and contribute to existing knowledge (Patel & Patel, 2018).

With the advent of ET, Mittal (2017, 1) argued that most of the library resources and services were transformed from analog to digital, for instance;

- i. printed library collection to Web based publishing like digital collection,
- ii. reference desks to Online/Virtual Reference Service,
- iii. closed access to anytime/ anywhere (24x7) access of material through internet libraries, iv. Manual indexing and Bibliographies to Full Text Databases,
- iv. manual Library Catalogue changed to OPAC (Online Public Access Catalogue) / Web OPAC, Manual sharing of information to Networking of Libraries (Resource sharing networks),
- v. inter-Library Loan Service to Electronic Delivery of Information

The new library technologies are available and many more are constantly emerging as the name suggests. ET for libraries are ubiquitous, libraries in Developed countries are leveraging ET to meet the needs of their users. Public libraries in Nigeria as well, need to have the aspiration in adopting the ET, they need to assess and adopt ET in order to promote their services. Scholars have identified different types of ET being used for libraries and library services. Despite the challenges, there are so many ET that are adoptable by the Nigerian public libraries due to their simplicity, affordability and importance Khaisar and Ali (2017). Mangano (2018) has stated that public libraries must have basic ET such as Wi-Fi, electronic resources video conferencing, maker space and virtual reality facilities Amrohi, Garg & Chauhan (2015) have specifically spoken on the Web Based ET and their applications in libraries and library services which attract little cost.

**Web Based Emerging Technologies:** Web Based library services are commonly referred as, Digital Library Services, Internet Library Services and Electronic Library Services. Web based technologies are of various types, such as portal, social networking sites, RSS, blogs and wikis (Ali & Khaisar, 2017). Web Based ET made library services become dynamic. According to Gavit (2019) users can access the library at anytime from anywhere. No need to go to the libraries physically and no time restrictions. With the advent of information technology and web based services, contents are now available to users on their desktop. Libraries applies Web Based technologies to describe various information about the library, working hours, holidays, layout plan of the building, rules and regulation of the library for different categories of members, rules of circulation, details about different staffs, and responsibilities (Amrohi, Garg & Chauhan, 2015). Web OPAC gives various approaches of document access in the given library including by author, title, publisher, accession number and collaborators etc. The advantages of Web Based ET for libraries were summarized by Ali and Khan (2019) as follows;

- i. it saves the time of the users,
  - ii. it gives equal opportunities for access to all users
  - iii. it enables on-line real time communication with other side network users
  - iv. there is Information dissemination for any number of users at any time
  - v. it enables exchange of e-mail and e-resources files in a global environment
  - vi. information can be made available in different locations and in different formats
- Public libraries in Nigeria can identify and adopt Web Based ET at very little cost and technical requirement.

**Cloud Computing:** Cloud computing is very important technology that revolutionised the world of Information and Communication Technology because of its potential benefits such as reduced cost, accessibility anywhere anytime as well as its elasticity and flexibility (Kadli, & Hanchinal, 2013). Khaisar and Ali (2017) defined Cloud computing as, “The practice of using remote servers on the internet to manage, store and process data instead of using a personal computer”. The authors added that Cloud computing is very cheap technology and easy to use, it involves a centralized data center, virtual server space, and secure transfer of data over the internet. Cloud computing have so many advantages and affordable by Nigerian public libraries. The advantages of cloud computing include low cost to own (CTO), agile updates, openness, zero initial investment, enables access to applications and data from any computer at any time (Yang, 2012). Cloud computing is the best for the libraries who cannot afford technology and staff, concludes Khaisar & Ali (2017).

**Social Networking Sites:** Maideen and Oke (2019), Jindaland Khan (2019) have further outlined the use of SNSs for public library services which is also a web based ET for public libraries. SNSs are Web Based ET that enables interaction and sharing via online. Users create content and interact with each other, forming online groups, sharing common interests or ideas. Libraries use these tools in carrying out professional services such as information delivery services, reference services, current awareness services and SDI. There are so many types of SNSs that are affordable by public libraries in Nigeria. Example of such SNSs are Facebook, Google+, Twitter, Instagram, these sites require cost little to make use of by libraries.

**Electronic Information Resources:** Electronic information resources are information resources that are available in electronic form, and these include resources available on the Internet such as e-books e-journals, online database, CD-ROM databases and other computer based electronic networks, among others, these resources that require a computer or mobile device to access are most. Today’s information users particularly our users prefer accessing and retrieving information through their laptops and smart phones, in order public libraries to remain relevant they should have available ER and access points (Mangano, 2018). The interesting thing is the availability of electronic information resources at no cost. Furthermore, libraries should digitize available and important manuscripts as well as establish Institutional Repository IR containing state and local government’s publications that can be accessed remotely. Through this information storage and retrieval can be simplified if the resources are available electronically. It helps the libraries to reduce space utilization and budget. On other hand all the archived materials can be stored with the support of open source ET.

**Video Conferencing:** Video conferencing is an ET that is recommended for every library. The technology provides a video and audio connection between computers in one of four ways: “by ethernet over a Local Area Network (LAN); via the Internet; over regular phone lines, known as POTS (Plain Old Telephone Service); and by ISDN (Integrated Services Digital Network), a special digital phone line. According to Isaac and Omame (2020), “Video conferencing is a live connection or a visual communication session involving two or more users regardless of their location for the purpose of communication” Video conferencing involves video and audio and transmission in real time. It is the use of multimedia application that involves two different media in digital form The cost of video conferencing technology also varies, from nothing to several thousand dollars (Folger, 2006). This technology needs to be adopted by Nigerian public libraries, it makes connectivity easier and more accessible for a range of remote communication needs. Video conferencing is used for civic engagement, community organizations, small start-up

businesses as well as connect homebound individuals to community meetings held at libraries (Austin Public Library), these services are as well applicable in the context of Nigerian public libraries. There was ET for public libraries that were identified by Mangano (2018). According to the author makerspace, video conferencing and virtual reality are must ET for libraries in order to remain relevant and serve the Jindal and Khan (2019). Public libraries in Nigeria have the capacity to use them and improve their services. These are:

**Makerspace:** Makerspaces is one of the most used ET by public libraries (Mangano, 2018) Maker spaces according to Aiyebilehin, Onyam and Akpom (2018) are “Any area where people gather to make and create. These spaces often include 3D printers and other technologies, but do not necessarily have to. In makerspaces, people share supplies, skills, and ideas, and often work together on projects.” The importance of maker spaces cannot be over emphasized, it enables users to experiment with the ET as well as encourage social and creative engagement. Aiyebilehin, Onyam and Akpom (2018) concludes that Makerspaces help libraries remain relevant by allowing them to reinvent and market themselves as leading-edge, and to demonstrate their relevance in their users’ lives, by offering pathways to economically valuable skills and civic engagement.

**Integrated library systems:** Integrated library system (ILS) or Library Management System (LMS) has complex program/database that carries numerous library functions together. The specific functions, usually called ‘modules’, comprise such things as: OPAC (Online Public Access Catalogue), which acts as a search engine for the library users find the available information.

- i. Acquisitions module: It will be useful for managing the book orders and expenditures;
- ii. Serials module: It will help to manage the newspaper and magazine subscriptions, track the pending Issues
- iii. Cataloguing module: For encoding the MARC records through Z39.50/SRU and make the items available in the OPAC.
- iv. Circulation module: This module provides the details of entire library transactions like Checked out and Check in of library materials, due data and to holds information of the patrons such as phone numbers, addresses, email Id. The ILS supports the library employees particularly in the acquisitions and cataloguing departments. The library employee of the book processing unit does their work using the ILS. So ILS/LMS technology is doing the vital role in the library. There are many ILS technologies are available as commercial such as CodeAchi Library Management System, LIBERO LMS, LIBRARIAN, Access-It, Soutron and open source model such as OPALS, koha, Evergreen, OpenBiblio, PMB. OCLC’s, WorldCat, Web-Scale Management Services, which are technologies which will help the libraries to share data globally. ILS broadens the door for interlibrary loan.

### **Opportunities for Adoption and Use of Emerging Technologies**

Despite the numerous challenges Nigerian public libraries are facing, there are opportunities to identify and use ET for the provision of library services as well as remain relevant to the society. The availability of open sources emerging technologies OSET is one of the great factors that will salvage Nigerian public libraries. The aforementioned argument was supported by Savard and Dione (2007), The authors although believed that there is difficulty in the management of library automation systems as well as other technologies related to information management in the Developing Countries due to the lack of resources which allow them to access technological tools as effective as those we find in developed countries. The authors finally concluded that

open source software may be a solution to these problems if well addressed. Ray & Ramesh (2017) believes that with the OSET there is a great opportunity for public libraries and Nigerian public libraries inclusive in this regard. Moreover, there is an ongoing open source movement which is agitating for free and equal access to information. Several organisations are committed to supporting and developing solutions based on OSS for libraries (Jain & Sinnaraja, 2019).

With the increasing availability of open source software, Mutula (2007) is of the opinion that library will not only adopt and use these available technologies for library services, but they will eventually develop their own software packages. Mutula (2007) added that “The openness of the source code and collaborative nature of OS software development allows local talent to cooperate within the globally distributed teams of specialists and modify and adapt software for local needs.” This will stimulate the growth of an indigenous software industry. In addition, the availability of free hosting and installation, support, and development services, libraries don’t need an IT staff to deploy software or advice on development of new features. The OSS provides an opportunity for libraries to take control of library services and collections. Another opportunity for adoption and use of ET by Nigerian public libraries is the recent development recorded by some public libraries in the country. Research has shown that some public libraries in Nigeria have some computers and ICT facilities in their libraries (Bassey, 2018). These tools provide a platform where free software packages can be installed, electronic resources can be searched, saved and accessed by users.

With the invention of Information and Communication Technology, libraries now use various types of technologies to aid the services they render. Everyday emerging technological advances affect the way information services are rendered to the community. Therefore, the impacts of these emerging technologies are felt by all libraries in every aspect. Therefore, the adoption of these emerging technologies into the operations of a library has the potential to provide a window of opportunities, changing the face of information services delivery of libraries including public libraries. Following this, Mahmood & Richardson (2013) outlined the opportunities of new technologies for libraries as follows:

1. Increased library’s relevancy to users: improved library’s image; allowed rich, interactive, timely, convenient services so as to improve service level and quality, and broaden range of services; increased users’ participation, and increased interactions and communication with users; broadened librarians’ perspective, draw on collective knowledge to better serve users; improved librarians’ inter-departmental communication and expedited, information dissemination to the users; facilitated instant problem solving with the benefit of traceable services; and improved knowledge sharing and collaboration.
2. Building brand loyalty: Promoting library and information services with new technologies helps libraries to not just advocate the library but also brings library users to become library advocates. Social Networking is a center for engagement that would enhance two-way communication like never before. This in turn builds the library’s image.
3. Saves Time: New technologies promoting library and information services save time and library staff hours. These technologies make it easier to reach a large number of library patrons in the most time effective manner. For example, using OPAC to search for a library resource is cost and time effective compared with the traditional way of searching through the card catalogue.

4. **Enhances fast Two-Way Communication:** One of the most important tenets of customer service is to be responsive to users concerns and show that the library is interested in and cares about their opinion. This is where social media come to play as social media create a forum for feedback in library promotion. For example, the use of e-SDI through e-mail to meet user's information need. This is a form of promotion that boosts the library's image.
5. **Saves Cost:** Many of these emerging technologies such as social networking, makerspace ILS (Koha), e-SDI cost next to nothing. Adopting the technologies for library and information services allows for a vast reach yet having very low cost. A library can perform actions/activities on social media like Facebook, blogs, twitter about products and services without investing a dime. The library can have patrons and the community and stakeholders to follow them or Twitter or "like" their Facebook account. Then, promotion can begin. In yet another vein, promoting libraries through social media increase revenue. Promotion of library resources and services through social media is becoming a necessity if librarians wish to raise revenue from stakeholders and the community.
6. **Increases Library Users:** With the global transformation in every aspect of human endeavor, most of today's library users are technology savvy. The online community is opened to all as long as there is Internet connectivity. Apparently, the adoption and use of these technology increases the number of users of the library. This can motivate a friend of a library fan to join the library. Also, the technologies can increase library patron's satisfaction with the library. This is to say that emerging technologies has become the catalyst in projecting library and information resources and services and maintain relationships with users

### **Challenges toward Use of Emerging Technologies**

Technology delivers several opportunities to reach and interact with the society. Libraries always aspire to adopt and make use of emerging technologies to make their services popular and satisfy the needs of their users. In spite of the opportunities presented by technologies for libraries, there are factors that obstruct the effective use of these technologies in Nigeria's public libraries. The major constraints are considered in this article. The findings of Krubu and Asowaru (2011) revealed that inadequate training and retraining of staff by management; inadequate funding, epileptic power supply and lack of search skills are the major factors militating against the effective use of technologies in libraries. Amongst others, inadequate funding, capacity building, irregular power supply were found as stumbling blocks toward use of technologies. Similarly, Oghenetega, Umeji, and Obue, 2014; Okojie, and Okiy, 2019; Lucky, Umeji and Obue (2014) have identified the challenges of emerging technologies adoption in Nigeria's public libraries as follows:

- i. **Funding:** Funding of libraries especially public libraries is still nothing to write home about. This has really constrained public libraries in embracing emerging technologies as some of these technologies are costly to purchase and install. Hence, depriving information seekers the opportunities provided by the technology.
- ii. **Erratic power supply:** The effective utilization of information and communication technology depends largely on effective and constant power supply. This is so, because cannot function effectively. It is therefore necessary that the institution or external system that wish to operate these technologies should make adequate provision for constant electricity supply since the electricity corporation (NEPA) now known as PHCN has become so epileptic. A generating set should be made available to supplement (PHCN) irregular supply. One municipal facility that is

the bane of Nigeria at the moment is supply of electricity. Electricity, which is an essential necessity for economic growth is lacking in Nigeria as a whole. Without electricity, it would be difficult to exploit the best that ICT could offer.

- iii. Lack of trained personnel: Nigerian public libraries that have managed to tap into information technology resources lack trained information technology experts. This fact has left the information technology services of the library performing little or no of its functions.
- iv. Policy structure of the Government: The growth of any communication technology in a society and hence its applicability for distance education depend to a very great extent on the degree to which policy makers recognize the importance of ICT in promoting a knowledge based society.

### **Conclusion**

In conclusion, ET has come to stay in libraries as a revolution in information service provision. They are seen as a transformation of libraries from the conventional to computer-generated technologies and information centers. There are quite a number of these technologies that the public library could adopt to make their services more effective than earlier. Additionally, ET has come with opportunities public libraries can leverage on to change the narrative of public library service in Nigeria.

### **Suggestions**

In doing so, it is therefore recommended that, since funding is the backbone of every development that comes into the public library,

1. The public library board is expected to work out more and better ways of sustainable funding to the public library. This would go a long way to see to the utilization of these emerging technologies.
2. Appropriate funding to public library can address other challenges faced in the library.
3. Training and retraining are recommended for librarians. These technologies are constantly evolving and revolving.
4. As libraries thrive on modern technologies, library staff are therefore, saddled with the responsibility of acquiring new skills and knowledge for onward adoption and use of the technologies to enable them provide round the clock library services to their diverse patrons.

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