

INFORMATION TECHNOLOGY AND LIBRARIES: PROSPECTS FOR THE 21ST CENTURY INFORMATION SERVICES

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Abstract

Purpose: The purpose of this paper is to highlight the different ways in which Information Technology (IT) is applied on information services delivery in the 21st century. The services discussed include reference services; Selective Dissemination of Information, current awareness services, cataloguing, bibliographic services, user education in relation to the impact IT has on them. The paper also goes ahead to highlight different modes used in delivering these services.

Design/Methodology/Approach: The paper adopted an exploratory approach through extensive review of related literature which succeeded in highlighting the relevance of Information Technology in effective information services delivery in the 21st century.

Findings: This paper found out the different areas in which Information Technology can be applied in libraries. There are also different modes through which the different services can be delivered.

Practical Implications: the emergence of ICT has caused a paradigm shift in the delivery of information services. Libraries are now faced with current trends in information services delivery. It is therefore left to libraries to adopt and apply these opportunities in providing information services that will suit the needs of their techno savvy users.

Originality/Value: in order to remain relevant in the face of emerging trends, libraries should maximize the opportunities provided by Information Technology in providing cutting edge information services delivery.

Keywords: Information Technology, Libraries, Emerging trends, 21st Century, Cataloguing, Information services, Bibliographic services.

Paper type: Conceptual.

Introduction

The technological changes witnessed by libraries in the 21st century have led to rapid changes, and a paradigm shift in the provision of information services. Information services now rely heavily on information technology in delivering cutting edge services. There is a shift from the traditional models to electronic and web -based models. The International Federation of Library Associations and Institutions (IFLA), Glasgow Declaration on Libraries, Information Services and Intellectual

Freedom (2002) highlighted information services as services that provide access to information, ideas and works of imagination in any medium and regardless of frontiers. New information resources, emerging services, alternative ways of organizing work, and increased expectations of users have greatly transformed the provision of information services in the 21st century. The advent of emerging trends arising from the application of information technology in libraries consequently has also positively affected the

delivery of information services. Danladi, Abu, Drisu, Okogwu, Akidi (2017) opined that the traditional ways of providing services in libraries are paving way for a more sophisticated means that requires information and communication technology (ICT) skills. Library users are increasingly becoming techno savvy and their expectations are also becoming more sophisticated.

Information is an economic resource needed for socio-economic development of any nation. It is indispensable for the development of man and plays a very important part in human life (Fagbe et al. 2015). Information technology is a big umbrella that covers activities connected with computer based processing, storage and transfer of information. It involves computer, electronic media, telecommunications, satellites and storage devices (Uddlin and Hassan, 2012). Information technology in the library context involves acquisition, processing, storage and dissemination of information (textual, numerical, pictorial and vocal) using computer-based technologies. According to Emuakpor (2002), information technology covers all forms of technology applied to the processing, storing and transmitting information in electronic format using computers, fax machines, electronic calculators, communication equipment and networks. In the same vein, Kochtanek (2002) affirms that information technology includes hardware and software that complies with the connection of major circulation tasks which are circulation control and overdue notices. The internet and its technology as revolutionized access to information and information sharing for the libraries, business world, education and individuals. Some of the information technological devices used to achieve this are; e-mail, usenet, telnet, File Transfer Protocol (FTP) and WWW (World Wide Web) (Ogunsola, 2004).

Pattern and Nature of Information Service Delivery in the 21st Century

The 21st century has ushered in tremendous growth and transformation in library services delivery. Application of information technology in libraries has brought about a lot of emerging

trends that are being applied to the way and manner services are rendered. As noted by Etukudo and Aliu (2019), the 21st century as the millennium of information, has been seen as the era of explosion of information output and information sources. Chakrabarti (in Danladi et al., 2017) opined that the 21st century library services are characterized by speed and precision in the production, transfer, access, and use of knowledge these include: reference, Current Awareness Services (CAS), Selective Dissemination of Information (SDI), cataloguing, bibliographic control etc.

El-Kalash (2019) also stated that library services in the 21st century focuses more on being digital or virtual because such a transition to the cloud is accompanied with sophistication. The author further stated that the services are delivered via the internet, websites, portals and social media applications. The services as listed by the author include: Ask-a-Librarian services, digital reference services, online document delivery, resource sharing, online reference queries, digital information literacy skills tutorials, digital current awareness services, access to electronic journals, online circulation service and digital selective dissemination of information to mention a few. In lieu of the emerging trends, the pattern of information service delivery has diversified. According to Ilyasu, Usman, and Kasim (2019) information services are now delivered through the following four means:

Face-to-Face: Here the user presents himself in person to access and utilize the information services provided by the library or information service center.

Web Based Applications: in this method, all services are delivered using the internet and web based applications.

Social Networking Sites: this involves the use of social media such as facebook, instagram, twitter, blogs etc. to deliver information services.

Instant Messaging Applications: Libraries could also use instant messaging applications such as telegram, messenger, whatsapp etc, to deliver quick reference services to their users.

The 21st Century Librarian

The 21st century librarian is one that has shifted from inactive to proactive library services with several opportunities presented by emerging trends that has come about due to Information Technology. There is a paradigm shift in service delivery that the librarian must adapt to and implement in order to satisfy the more sophisticated information needs of its techno savvy users. Stanley (2003) opined that the librarian of today must keep more and more on the cutting edge of many areas of technology. The author also stated that if librarians are to assist patrons in making the most of these innovations, then the librarians themselves must keep one step or more ahead in their uses and knowledge of the data available. Librarians today are finding it necessary to provide ever-increasing and varied services to patrons they never see. Virtual reference in all types of libraries and support of distance education in academic institutions creates a whole new type of library user: the faceless patron. Library foot traffic is declining, but the expectations of libraries and librarianship are constantly increasing. Librarians are forced to wear many more hats: data miner, researcher, internet and computer expert, multimedia specialist and webmaster to name a few (Lovato-Gassman, 2003). Etukudo and Aliu (2019) therefore urged the 21st century librarian to be armed with competent skills that will enhance the provision of effective library services to meet client's changing information needs.

Advantages of Information Technology in Library Services

The emergence of information technology in libraries has changed the library operations from traditional to digital and has improved library services to users immensely. Igbeka (2008) and Adeleke (2014) enumerated some of the benefits of information technology to library services as:

- Change in the philosophy of the library from being a physical structure housing books to a data base of universal access of information
- Global integration of library services

- Universal access to information due to the use of internet
- Effective literature review search needs
- Establishments of digital libraries
- Provision of news services, revitalize the existing services by providing faster access to the resources thereby overcoming space and time
- Providing better information services
- Encourage networking and resource sharing at local levels
- To upgrade the activities of professionals
- Information is preserved, conserved over a long period of time and prevent image or quality degradation
- Placing orders, checking to avoid duplication of books, price, ordering etc are done very effectively using ICT techniques
- To capture, store, manipulate and distribute information
- To digitize the documents for preservation and for space saving
- To improve the efficiency of library functions and global integration of library services
- To improve the cost effectiveness of library operations
- To support library functions such as circulation, serials, control, acquisition control, stock maintenance and other routine office works and developing in-house database
- Increased innovation and transformation of knowledge found in hard copy books into softcopy
- To access library catalogues databases of other libraries through library networks.

Application of IT in Information Services

Information services are a range of activities that the library performs to actualise the information needs of the users. The emergence

of information technology has offered a lot of opportunities for improvement in library services delivery in Nigeria libraries. Libraries can now offer cutting edge services to suit the needs of their techno savvy users. Library services in Nigeria therefore have to be redesigned and readjusted to keep pace with the global trend in performance and information service delivery (Aboyade, Madu & Aboyade, 2016). The following services are discussed:

Selective Dissemination of Information (SDI)

Selective Dissemination of Information (SDI) also known as Strategic Dissemination of Information is a rapid developing field. It refers to tools and resources used to keep a user in the library informed about new resources on specific topics. Selective Dissemination of Information (SDI) is defined as the system in which selectively and automatically compiled information about new documents is disseminated to researchers, scientists and others who need these documents/information or supplying each user or group of users with a reference of documents or abstracts relating to their predefined areas of interest. It involves notifying the material that matches the interests of the client (Ashikuzzaman, 2019). It is a type of alerting service which helps the library to identify users and their needs thereby selecting information resources that meet those needs for onward delivery to individuals or group of users. Semertzaki (2011) stated that the specific nature of SDI enforces the library to approach the users on a personal level. SDI system is based on two types of profiles; users' profiles and document profiles which are matched to decide about the relevance of any new document for an individual user. It can be disseminated manually or through the use of ICT tools which help in repackaging and rebranding SDI services to the library clientele. Chatterjee, (2017), stated that SDI system has a mechanism for feedback from the side of users. One of the advantages of SDI is that it enables the information user to have access to the right information at the right time and place. Some of the objectives of Selective Dissemination of Information (SDI) services according to Ashikuzzaman, (2019) are as follows:

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- i. To provide current information on a predefined area of interest.
- ii. To receive, scan and provide the literature / information to the right users at the right time.
- iii. All the current information which is relevant to the interest of the user must be brought to the notice of the user (notification).
- iv. All the relevant information which is published elsewhere in the world (in English or other languages) should be located through various sources.
- v. To achieve current requirements through the scan of current material such as journals, current awareness bulletins and other important resources.
- vi. To save the time of the user.

Current Awareness Services (CAS)

These are services or publications designed to alert scholars, researchers, readers, customers or employees about recently published literature in their field(s) of specializations, or about newly acquired information in the library. It involves notifying library patrons about current happenings and collections of the library within a short period of time. It is concerned with current published information. Omeluzor and Omeluzor, (2017) assert that current awareness service is provided to researchers to acquaint them about recent publications that might help them in their research work. Some libraries use display boards and shelves to draw attention to recent additions while some others utilize web-based systems. Libraries and information centres provide CAS which is an important service that fulfils current approaches to information due to the advent of information technology via the internet.

Current awareness services may be simply a copy of table of content or a bulletin containing bibliographic records of articles selected from the current issues of journals and other materials and usually organized by subjects (Ndukwe, 2012). Libraries presently, compile current awareness bulletins using predefined search strategy and running on the database

either on CD-ROM or online periodicals and getting the desired result. The output can be stored on a local system and disseminated online through internet, intranet and off-line (print, CD-ROM, Mail). Current awareness services powered with IT can help users and researchers to be aware of the latest development in their field of interest.

Inter-library Loan Service

Inter-library loan service can be used interchangeably to describe resource sharing, library consortia, networking etc. The necessity of resource sharing was born out of the fact that no single library is alone star that can acquire all the information resources needed to satisfy the information needs of its users. Rudling (2001) cited in Mohammed (2014) defines library resources sharing as a process of making the resources of a network of libraries available to users entitled to use of the libraries. The application of IT in library resource sharing by sharing databases has made exchange of information for different purposes easier and faster and this has placed libraries in a most advantageous position that will help them serve the information needs of the global village (Nkanu and Okon, 2012).

Reference Services

The advent of ICT has transformed reference services from the question and answer type of assistance provided in the traditional inter-personal reference to virtual reference desk services. Technological change, in the form of the development of the internet and electronic resources has also affected the reference work. Auster and Chan (2004) confirm the development of electronic resources which has changed the volume, nature, and quality of the information sources available. Where reference librarians once relied solely on print resources, they can now answer the majority of questions accurately using web -based sources.

Reference service can also be run on auto-pilot where the library users do not necessarily have to meet with a reference librarian one-on-one for inquiries; rather they communicate with smart programs running Artificial Intelligence (AI). Others include:

- **Ask-a-Librarian:** allows the user to click on ask a librarian link to send a formatted enquiry to the reference librarian who either provides an answer, links to resources or a link to a subject specialist (Ndukwe, 2012). Interactive tools like social media tools (whatsapp, 2go, facebook, e-mail etc) now enable reference interviews online thereby building access to information.
- **Chat reference:** is the human-intermediated reference service provided via online real time chat. Chat reference can be provided via instant messaging, commercial software, or homegrown applications. Unlike desk reference, chat reference has made it possible for libraries to collaborate and form consortia to share manpower and resources in providing these services.

Bibliographic services

Bibliographic services involve compilation of bibliographies, state-of-the-art report, reading list etc. The availability of databases in electronic formation on CD-ROM or online makes for cost effective information retrieval compared to browsing through manual indexes and abstracts which is time consuming and tedious (Ndukwe, 2012). Electronic database provides unique search features such as keywords, subjects, author, source, year of publication, language etc. which makes for easy and quick information retrieval.

Cataloguing Services

Cataloguing and classification are now done electronically via the library management system. Various library databases could be accessed and their records imported into the host library's database for editing and saving into their database. This has helped libraries use others records for more efficient and faster way of generating records for their libraries. Some of these services include:

Library of Congress Catalogue: this is a free service provided by the United States library of congress that enables search and download of MARC records from their database.

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- **Bookwhere:** this is a commercial copy cataloguing service that enables libraries search, analyse, edit and export bibliographic records.
- **Worldcat:** a global catalog of library collection, offers services that enable librarians perform cataloguing. These services include: **Connexion:** (Acquisition and online cataloguing tool) and **CatExpres:** A simple-to-use copy cataloguing tool (Acquisition and cataloguing).
- **Biblios:** this is a free browser-based cataloguing service with a data store containing over thirty million records. It is the hosted version of biblios with additional social cataloguing features and a built in federated search system allowing cataloguers to find records from any Z39.50 target.

Online Public Access Catalogue (OPAC)

The advent of electronic cataloguing has given rise to the generation of Online Public Access Catalogue (OPAC) which is an online database of information resources held by a library. It is the online interface through which users become aware of the library's collection. The records generated from electronic cataloguing automatically forms the OPAC. Users can quickly and effectively search for the information resources of the library through the OPAC using search terms such as title, author, subject, control numbers etc. for easy location and retrieval of required information materials.

Customer Relations/User Education

User education and customer service are important aspects of library services. To maintain quality standard in service delivery, it is of great importance to continuously interact with users for feedback on service delivery and satisfaction. Introducing information technology to this service by using ICT tools like e-mail, web forms, discussion forum and list serve, bulletin boards etc will help improve the service, offer scope for innovations and greater peer participation, provide a faster and more transparent means of demonstration.

Inadequate technological infrastructure:

Technological infrastructure such as telecommunication facilities, bandwidth facilities, software application etc is lacking in many libraries in Nigeria and inadequate in few. Jegbefume (2014) affirms that the internet service providers make use of expensive technology like VSATS and radio-links for most institutions libraries hence, making the internet connections to be very slow.

Inadequate funding: it is clear that no library can develop beyond the available financial resources at its disposal. According to Jegbefume (2014), the cost of library automation, internet services using VSATs and other facilities needed for the takeoff of library automation are enormous, hence adequate finance is needed to facilitate and implement IT in libraries.

Shortage of management and technical expertise:

Many library schools in Nigeria still operate the conventional syllabus which is IT deficient. The reliance on the traditional way of training librarians without exposure to the practicality of the new technology will make librarians to be ill prepared for the demands of the technological driven working environment.

Inadequate training: A lot of training opportunities that abound for librarians to keep themselves abreast of emerging technologies are not adequately utilized. These training could be online or offline. These trainings will help acquire the new knowledge and skills required to keep in touch with 21st century library service delivery.

Technophobia: one of the major problems faced by most libraries is the fear for the new technology so they refuse to embrace change and as such make the traditional libraries their abode.

Lack of maintenance and replacement of ICT facilities: the maintenance and replacement of spare parts of hardware and other ICT facilities have always been a problem in Nigeria due to what is called "Poor Maintenance Culture".

Most libraries know how to acquire facilities but maintaining it becomes a problem.

Conclusion and Recommendations

The delivery of information services has witnessed a lot of changes in this 21st century. This is largely due to the application of information technology. Almost all library and information technology services, some of which were discussed have been positively affected by technology. The profession is fast changing and evolving. Librarians have to equip themselves by acquiring the necessary skills. The advantages of

information technology and the need to apply them in information services cannot be overemphasized; as it helps libraries offer cutting edge services that will suit the needs of their techno savvy users. It is therefore recommended that librarians should keep abreast of these emerging technologies and undergo training and retraining so as to acquire adequate skills that will be applied in the workplace. There should also be proper planning put in place to make sure the IT facilities are in place and are well maintained.

References

- Aboyade, W. A., Madu, U. W. & Aboyade, M. A. (2016). ICT and library services as catalyst for change and national development. *Journal of applied information science and Technology*, 9(1), 120 – 126.
- Adeleke, I. T., Lawal, A. H., Adio, R. A. & Adebisi, A. A. (2014). Information technology skills and training needs of health information management professionals in Nigeria: A nationwide study. *Health Information management Journal* (unpublished study).
- Ajayi, S. A.; Shorunke, O. A. & Akinola, A. O. (2013). Factors influencing the use of Information Communication Technologies (ICT) by library personnel in college Libraries in Osun and Oyo states, Nigeria. *The information technologist*. 10(1), 145 – 156.
- Akanni, S. B. (2007). The virtual library: Issues, prospects and challenges. *Nigerbiblios* 18(1 & 2), 116 – 131.
- Ashikuzzaman, M. D. (2019). Selective Dissemination of Information (SDI): meaning and definition. *Library and information science academic Blog*. Retrieved from <http://http://www.lisbdnet.com/>
- Chatterjee, Amitabha (2017). Elements of Information Organization and Dissemination. Retrieved from <https://www.sciencedirect.com/topics/social-sciences/selective-dissemination-of-information>
- Chan, D. C. and Auster, E. (2003). Factors contributing to the human resource development of reference librarians. *Library and Information Science Research*, (25), 265-286.
- Danladi, D., Abu, H. K., Drisu, I. N. and Akidi, J. O. (2017). The impact of information age on service delivery of the National Library of Nigeria. *International Journal of Development in Information*. 3(1&2), 75-96.
- El-Kalash, K. M. (2019). Digitization and digital library services in the 21st century. In K. N. Igwe, S. A. Sadiku & I. B. Edam-Agbor (Eds.), *Themes And Trends In Information Science* (pp. 136-144). Lagos, Nigeria: Zeh Communications Ltd.
- Emuakpor, A. O. S. (2002). *The Impact Of Information Technology In Collection Development And Management In Libraries Information Science And Technology For Library Schools In Africa*. Ibadan: Evi-coleman Publications.
- Etukudo, G. E. & Aliu, I. M. (2019). 21st century Librarians marketing strategies: costing, pricing and effective information delivery. *Journal of Applied Information Science and Technology*, 12(1), 69-75. Retrieved from www.jaistonline.org/12vol1/10.pdf
- Fagbe, A. O.; Amanze, R. C., Oladipo, S.; Oyenuga, E. & Adetunji, O. O. (2015). The role of information technology (IT) in the Academic library. Paper presented at the 3rd school of Education and Humanities international conference on the future of higher education in Africa held at Babcock University August 24 – 26, 2015.
- Igbeka, J.U. (2008). *Entrepreneurship in Library and Information Services*. Ibadan, Nigeria: Stirling-Horden Publishers.
- Ilyasu, J. A., Usman, I. and Kassim, A. (2019). Delivery of information services by practitioners in the 21st century. In K. N. Igwe, S. A. Sadiku & I. B. Edam-Agbor (Eds.), *Themes and trends in information science* (pp. 136-144). Lagos, Nigeria: Zeh Communications Ltd.
- Jegbefume, C. M. (2014). The role of library vis-à-vis information and communication technology in National building. *Jewel Journal of Librarianship*. 7(1), 125 – 129.
- Kochtanek, T. R. (2002). *“The Evolution Of LIS And Enabling Technologies”*. Library Information Systems: From Library Automation To Distributed Information Access Solutions. Westport, CT: Libraries unlimited.
- Lovato-Gassman, B. (2003). Librarians in the 21st century. In: Bridges, C. (Editor) *Expectations of Librarians in the 21st century*. London: Greenwood Press.
- Ndukwe, C. (2012). Information and Communication Technology (ICT) and information service delivery in Libraries. A seminar paper presented in the department of educational Technology/Library and information, Faculty of Education, University of Uyo, Akwa-Ibom.
- Nkanu, W. O. & Okon, H. I. (2010). Bridging the gap through ICT in Nigeria Libraries. *Library Philosophy and Practice*. 10(5), 123 – 131.
- Ogunsola, L. A. & Boucouvalas, M. (2004). Nigeria University Libraries and the challenges of globalization: The way forward. *Electronic Journal Of Academic And Special Librarianship*, 5(2-3), 85 – 97.

Semertzaki, Eva (2011). Special Libraries as Knowledge Management Centres. Components of a knowledge management system at a special library.

Stanley, D. H. (2003). The 21st-century librarian, pp 135-138. In: Bridges, Carl (Editor)*Expectations of Librarians in the 21st century*. London: Greenwood Press.

Omeluzor, S. U. and Omeluzor, G. U. (2017). *A Guide to the Use of Library, Information Sources, Tools*

and Services in an ICT Environment (21st Century Approach). Lagos: Jamiro Press Link,

The International Federation of Library Associations and Institutions (IFLA) Glasgow Declaration on Libraries, Information Services and Intellectual Freedom (2002). Retrieved from http://www.ifla.org/publications/the_glasgow-declaration-on-libraries-information-services-and-intellectual-freedom.