



# Utilization of Emerging Technologies for Improved Service Delivery in Public University Libraries in Rivers State, Nigeria

**Bernadette C. N. Ukaegbu**

University of Port Harcourt, Rivers State, Nigeria

**Emmanuel Okwu**

Ignatius Ajuru University of Education, Nigeria

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## Abstract

*This study investigated the utilisation of emerging technologies for improved service delivery in public university libraries in Rivers State. Two research questions guided the study. The research questions were to identify the emerging technologies in use for improved service delivery among public university information professionals in Rivers State and to find out the extent to which information professionals utilized emerging technologies for improved service delivery in public university libraries in Rivers State. The population consists of 50 information professionals in the three universities; University of Port Harcourt (20), Rivers State University (19) and Ignatius Ajuru University of Education (11) respectively. A sample size of 50 information professionals in the universities representing 100% of the population served as respondents. An accidental sampling technique was used for the study. All the information professionals that make up the population were used. A 12-item questionnaire was used for data collection. Cronbach alpha statistics was used to obtain the 0.77 reliability coefficient of the instrument. Mean scores and standard deviation were used to answer the research questions while the z-test statistics were used to test the hypotheses at a 0.05 level of significance. The result amongst others revealed that social network websites technologies and video-based communication platforms like the Zoom and WebEx are in use in both Federal and State library but digital reference robots, library automation SOUL software and Protocols VoIP (Voice over Internet) was not in use in both Federal and State university libraries. It was recommended that university management should give the required attention to library use, provide and encourage the application of digital reference robots, library automation SOUL software and Voice over Internet Protocols (VoIP) and other current gadgets to be used to meet the demand of library users, most especially at this period of post covid-19 pandemic.*

**Keywords:** Utilisation, Emerging Technologies, University, Libraries, Information Professionals.

## Background to the Study

The world is full of many exciting, ugly stories and happenings that people dare to know, associate with, disassociate from and sometimes pen down to continuously reflect on the past events in the future. Most times, past and current situations and conditions are reflected in informative materials and gadgets that are at the disposal of libraries either in books and non-book materials, videos, audios, audio-visual, electronics of different kinds and functions, crafts, scriptures and the likes. People of different classes and races have to improve their skills to cope with modern life, be it in their workplaces, organizations, institutions, social or in their private lives.

Libraries are regarded as one of the foremost leading providers of lifelong learning possessing the potential to meet the individual learning needs of every user. Therefore, since much fascinating life encounters are traceable to what goes on in the information rested in the libraries, there would be a need for increased awareness and investment in libraries and library networks to essentially provide workers and users with increased skills to drive needed innovations and technologies. The integration of emerging technologies into library and information services has accelerated the creation of new modes of service delivery and activities for knowledge enhancement and productivity (Omehia et al, 2021). Interestingly,

people can learn virtually at any time and in any place they choose with the help of emerging technologies. Notwithstanding, information professionals before now were mostly used to handling library activities in a physical manner in which almost everything was done face to face. There was little inclusion, and use of some technological applications like the e-library with its associated gadgets and materials and some other gadgets and applications which were not in practice as sophisticated as it is now after. The widespread of the COVID-19 pandemic led to fast and radical changes in the mode of library service delivery due to social distancing and lockdown measures that were imposed both in the early and later phases of the pandemic (Ameh, et al., 2021). The development of ICT and the Internet have softly created a new environmental condition allowing the libraries to enhance and support research, teaching and learning even in face of uncertainty. Although the provision of remote access to electronic resources by libraries is not new, user-friendly methods used by some libraries and the number of emerging resources at disposal during the pandemic and now is exemplary.

Many academic libraries in Africa and Nigeria in particular are yet to build an online platform to deliver their services. However, leveraging a tech-led holistic approach that can help to cube the challenge of the time and beyond and to keep the libraries functioning without a halt. Libraries have emerged as continuous learning institutions and have acted smartly to see that, their activities are continuously undertaken to respond to the demand of users and play a vital role in supporting students' academic performance. Omehia et al (2021) in their study on Librarians' ICT competencies and utilisation of emerging technologies noted that for librarians to utilise emerging technologies to render effective service delivery, ICT skills are needed. However, it was discovered that librarians' had the ICT skills to utilise emerging technologies in service delivery but were not delivering library services with emerging technologies.

Nevertheless, some librarians are yet to improve their literacy level in the area of library automation, digital library, and institutional repository, etc to be able to work professionally with the time. In another scenario, Kumar (2017) study shows that libraries information professionals working in various educational institutions are mostly computer literate and have significant basic ICT skills to handle the library, nevertheless, there is an opportunity to develop innovative ICT skills and implementation in the library

to deliver improved ICT-based library services.

Currently, as against the traditional libraries, the trends of libraries include a digital or virtual method of a library collection that offers remote access to their users. The adoption of ICT, the Internet and particularly the World Wide Web have transformed library services unlike before. As a result, there have been changes in the normal functioning of libraries in the digital world that may have deemed it necessary for information professionals to seek and be possessed current lifelong skills. This is necessary to be able to practice their profession effectively to reflect the current trends of library activities and practices. However, managing information effectively for the routine situation is critical. Nevertheless, during a period of crisis like the covid-19 pandemic which is a health challenge, the way information is gathered and used is crucial and could make a commendable difference between positive outcomes and exacerbated scenarios. Thus, African Library & Information Associations & Institutions (AfLIA) (2020) posited that misinformation about a scenario as in the case of COVID-19 could only engender false belief and generate fear, promote quackery and also undermine scientifically proven ways that could limit the spread of the virus.

### ***Theory of Technology Acceptance Model (TAM)***

The Theory of Technology Acceptance Model according to Scherer et al,(2019) was developed by Davis in 1986 who argues that the acceptability of an information system depends on perceived usefulness and perceived ease of use. Perceived usefulness accordingly is the degree to which a person believes that the use of a system will enhance his job performance. They further explained perceived ease of use to mean the degree to which a person believes that the use of a system will be effortless. This implies that if librarians believe that the use of emerging technologies will be useful to their work it will drive their motivation toward the use of emerging technologies. Also, if they perceive that the use of emerging technologies will not be difficult in library services delivery, it will motivate them to use the technology.

Technology Acceptance Model (TAM) has been applied to several studies relating to users' acceptance and use of various technologies in different contexts and various disciplines including Library and Information Science. Ammarukleart (2017) applied the theories in his study on the factors affecting faculty acceptance and use of institutional repositories in

Thailand and confirms that performance expectancy, social influence, and resistance to change were direct determinants of faculty members' intention to use institutional repositories. Scherer et al, (2019) applauded TAM models for being a good choice in explaining teachers' adoption of digital technology in education.

There are various services in library and information Science, these services are offered with the use of emerging technologies which require that librarians accept and adopt these technologies for effective service delivery. On the other hand, non-acceptance could lead to poor service delivery. This study therefore adopted the TAM Model to ascertain the acceptance and use of emerging technologies in library and information services.

### ***Emerging Technologies in Use for Improved Service Delivery in Public University Libraries***

Emerging Technologies according to Omehia et al (2021) are the ICT tools that although may have been in existence for a while yet, are just being realised or to be largely realized and adopted by particular professions in their professional activities. They identified cloud computing, barcode reader, social media, web 2.0, institutional repositories as some of the emerging technologies in library and information services. During the ugliest time of covid-19, most library services offered to users were skeletal provided. During this period, Duke University Libraries which was completely shut down provided teaching and online services to students and provided about 40% of their print collections to library users (Duke University, as cited in Williams, 2020). Within this critical period, users were not able to access the library physically so the library has to reach their users to fulfill their requirements via different platforms and technologies. Halaweh, (2013) named some emerging technologies in use but have not been practiced by so many information professionals in many institutions including; cloud computing, near-field communications, ambient intelligence, virtual reality, and social network websites technologies. Yang and Lili, (2016) included metadata, web conferencing and mobile technologies as emerging technologies. Hassa, (2020), Nsirim (2020) and also listed emerging technologies in library and information services including metadata, cloud computing, smart library, institutional repositories, robotics and semantics technologies QR code, RFID technologies, library automation and database, FAQ, Library Mobile App,

mobile technologies, social media, web 2.0, Remote login services, and online databases

Jalal, (2019) figured out some of the technologies including the use of OPAC, library automation, and Barcode technology which play in making the delivery of library service to be more efficient and effective. With the help of software, library professionals can organize a virtual seminar or webinar online to reach their users to give effective service as required or introduced. Webinar software packages provide an online platform that facilitates mutual interaction between two persons. It provides real-time interactive features such as screen sharing, polls/voting, live chat, multiple hosts/clients, and questions and answers. This technology also provided online training and learning, lectures, etc. It can be leveraged by libraries for knowledge-sharing purposes among the staff, researchers or users (Asif & Singh, 2020).

Many Libraries have indulged in digital service delivery through organizing online exhibitions, describing the content on the websites and the application of the Lets Read Together online campaign. Efforts have also been made to boost access to library resources including online and offline by increasing the number of electronic resources (Asif & Singh, 2020). Virtual Reference Services (VRS) is another technology that is introduced but has not yet been put to use in so many places. The virtual reference technique is mostly used in communicating the information needs of the academic community which include video conferencing and voice over IP, email, web-based chat, digital reference robots, texting services and instant messaging (Mawhinney, 2020; Bera, 2019). In the same vein, the use of library automation, OPAC, and Barcode technology emerged as a key role to enhance libraries and librarians to realize the need to be regularly trained to efficiently work to service efficiently (Basahuwa et al., 2020).

Virtual reference services are seen by Mawhinney, (2020) as a non-physical reference service provided using ICT tools that include Voice over Internet Protocols (VoIP) and email, which Kumar & Roy, (2021) describe as a technology used for conveying voice in the form of digital packets over IP-based networks which could be private or public network that enables users to communicate to each other over the internet, IM and social media. It has certain characteristics which are personal, informal, and conversational. Libraries can utilise Zoom, Facebook Messenger, Blackboard and Google Hangout to provide platforms for information dissemination. Some of these are used

in teaching remotely by using a video-based approach like a programme called VoiceThread which is used to record short videos to explain the content of the class. Considering the importance attached to this, academic libraries in Rivers State need to integrate the use of VRS to meet the information demands of library users, especially the students.

***Extent to which Information Professionals Utilize Emerging Technologies for Improved Service Delivery in Public University Libraries***

Emerging technologies have been incorporated into the library and information services for enhanced service delivery. Meanwhile, if technologies are integrated and information professionals lack ICTs knowledge or competencies to effectively utilize them it will amount to nothing. On this note, necessary skills would be essential for information professionals for excellent job performance in the libraries. As a matter of necessity, information professionals should be prepared for emerging technologies to enable them to handle different jobs as required by different ICT tasks. According to Nsirim (2020), the level of ICT competencies required varies from one position to another depending on the tasks and duties involved. For example, for a librarian to be to manipulate word processing, desktop publishing and use Micro office suites, basic computer competency is required. On this note, working in a web2.0 situational environment, it is expected of the information professionals to be competent in the use of various social media platforms that could help to discharge services effectively, including Facebook, Twitter, LinkedIn, Zoom, yahoo and blogs. In this technological world, information professionals need to possess the ability to retrieve information from various search engines such as Google and Altavista as well.

In the same vein, Kumar, (2017) also identified ICT tools information professionals can effectively utilized for efficient work performance to include; the use of communication technology like fax, video conferencing and internet, emails, , voicemail, telephone and remote control technology that provide a platform to work with a remotely located computer system to smartly access all subscribed e-resources anytime and anywhere with inclusive of library security such as Radio Frequency Identification (RFID) and Quick Response (QR) Code Technology, Closed Circuit Television (CCTV), Doyle (2019) also foresaw some skills information professionals would need to possess in a technological library operations to include

online email management competency, collaboration skills, desktop publishing, social media management with respect to e-library users, text digitization, spreadsheet, , content management, document management, web design and development, library automation, database management and retrieval skills to be able to manipulate the digital library confidently and effectively due to emerging technology surfacing by the day.

These skills are necessarily needed to conformably exploit the ever-surfacing technologies and only those who are digitally savvy can use such technologies to work across the network to efficiently deliver assigned roles. In this case, having ICT skills alone is not all that matters for service delivery, but it also contributes greatly to the enhancement of human society (Onuoha et al., 2019). However, Abdulrahman and Habila, (2017) attested to the fact that the use of ICT in library services is not a recent development but the level of utilization for its success to be attained is worrisome. It therefore requires preparing a new generation of information professionals through digital training to effectively utilize the emerging technologies.

Notwithstanding, emerging technologies in library and information services including metadata, cybrary, integrated library management systems, cloud computing, crowdsourcing, institutional repositories and a host of others are credibly making academic library services operationally easier but are not well utilized in their full potential (Nsirim, 2020). Google Hangout is an online communication platform that supports SMS, video chat, and VoIP features which are also applications used by information professionals in some libraries around the globe (Abdulrahman & Habila, 2017). VoIPWhatsApp, a free application that uses the internet to send messages, audio or video is another application that information professionals are currently using. Instant Messaging (IM) is also an online communication that offers real-time text transmission over the internet (Bera, 2019). It gives a platform for two people to chat online by typing a message into a specialized window or ‘chat’ room as generated by the IM software. File transfer can be added including voice or video chat and clickable hyperlinks. Some of the IM communication tools library users or information professionals can use freely for chat reference services include but are not limited to WhatsApp, Morris Messenger, AOL, Yahoo and WeChat. This has been regarded as one of the most efficient means of communication with reference information professionals about convenience and

ease of use (Mawhinney, 2020). However, if academic libraries need to remain responsive and relevant to their customers, they must exploit the conversational nature of social media like Facebook, Twitter, etc. (Williams, 2020).

### **Statement of the Problem**

The outbreak of covid-19 has led to the emergence of digital technologies which are significantly changing the way information is accessed, used and managed in the world of library life. Due to the changing situation in the technological world and many other inventions that are taking place in every phase of life, information professionals need to enhance their knowledge and skills to be able to cope with the technical change at their workplaces and effectively deliver services to library users in a way that will bring about development. No matter the awareness of technological innovations in library operation, if information professionals in public university libraries in Rivers State are not abreast with emerging technological skills, they will effectively and efficiently deliver library services to the best of their users or customers.

However, Information professionals and library users seem not to be abreast with emerging technologies in use and practiced by so many information professionals in many institutions like cloud computing, virtual reality, and social network websites technologies. This situation seems to cause a lot of setbacks meeting up with indexing and abstracting of library materials, wastage of time, epileptic and skeletal operation of services which causes discouragement to library users and undermining notable information that is to research for different academic, social, economic and political purposes.

The operation standard on libraries situated in the respective public libraries in Rivers State seems to be operating with the little electronic operation. This implies that emerging technologies like, RFID technologies, cloud computing, smart library, institutional repositories library automation, library Mobile apps, remote login services, robotics and semantics technologies are not fully or not even operational in public university libraries in Rivers State. This worrisome situation necessitated the study to survey the utilization of emerging technologies for improved service delivery in public university libraries in Rivers State.

### **Aim and Objectives of the Study**

The study investigated the utilisation of emerging

technologies for improved service delivery in public university libraries in Rivers State. The specific objectives of the study are to:

1. Identify the emerging technologies in use for improved service delivery among public university information professionals in Rivers State.
2. Find out the extent to which information professionals utilize emerging technologies for improved service delivery in a public university in Rivers State.

### **Research Questions**

1. What are the emerging technologies in use for improved service delivery among public university information professionals in Rivers State?
2. To what extent do information professionals utilize emerging technologies for improved service delivery in a public university in Rivers State?

### **Methodology**

The study employed a descriptive survey research design. The population consists of the 50 information professionals in the three universities in Rivers State namely: University of Port Harcourt (20), Rivers State University (19) and Ignatius Ajuru University of Education (11) respectively. A sample size of 50 information professionals in the three universities representing 100% of the population served as respondents using the census sampling technique. The instrument that was used for data collection in this study was a 12-item questionnaire titled: "Utilization of Emerging Technologies for Service Delivery in Public University Libraries Questionnaire" (UMTSDPULQ). The questions covered emerging technologies in use for improved service delivery and the use of emerging technologies for improved service delivery in a public university in Rivers State. The instrument was validated by two experts, one in measurement and evaluation, University of Port Harcourt and another in the Department of Library and Information Science, Ignatius Ajuru University of Education, Port Harcourt. The data was gathered with the help of two research assistants who briefed the items in the questionnaire. The data was collected from time to time within a week which gave the respondents enough time to respond to the questionnaire. The data were analysed using mean and standard deviation. The decision to accept and reject was based on the criterion mean of 2.5 which implied that any item with the mean score of 2.5 was accepted and rejected if below. The result was presented in tables.

## Results and Discussion

### Data Analysis and Empirical Results

**Research Question 1:** What are the emerging technologies in use for improved service delivery in public universities by information professionals in Rivers State?

Table 1 indicated that items number 6 had the highest mean score of 3.46 followed by item 4 with 2.8 which are above the criterion mean of 2.50 indicating that, social network websites technologies and video-based communication platforms like the Zoom and WebEx are in use in both Federal and State library for improved service delivery. Meanwhile, items 1, 2, 3 and 5 had mean scores below the criterion mean of 2.50 indicating that digital reference robots, library automation SOUL software and Voice over Internet Protocols (VoIP) for sending voice in the form of

digital packets over IP-based networks are not in use in both Federal and State university libraries in Rivers State.

**Research Question 2:** To what extent do information professionals utilize emerging technologies for improved service delivery in public university information professionals in Rivers State?

Table 2 indicated that item number 6 had the highest mean score of 2.86 followed by item 4 with 2.61 which are above the criterion mean of 2.50. It simply means that information professionals in both Federal and State Universities utilized video-based communication platforms like the Zoom and WebEx in the library and social network websites technologies in the library for improved circulation, reference and current awareness service delivery. Meanwhile, items 1, 2, 3 and 5 had mean scores below the criterion mean

**Table 1.** Mean and Standard Deviation Analysis of Information Professionals in Federal University and State Universities on emerging technologies in use for improved service delivery in public university information professionals in Rivers State

S/N	Items	Information Professionals in Federal University		Information Professionals in State University		$\bar{X}_1$ $\bar{X}_2$	Remark
		$\bar{X}$	SD	$\bar{X}$	SD		
1	Digital reference robots are in use in your library for improved service delivery	2.12	1.18	2.01	1.22	2.07	Disagreed
2	library automation SOUL software are in use in your library for improved service delivery	1.89	1.27	2.12	1.18	2.01	Disagreed
3	Voice over Internet Protocols for sending voice in the form of digital packets is in use in your library for improved service delivery	1.94	1.25	2.7	1.36	2.32	Disagreed
4	Video-based communication platforms like the Zoom and WebEx are in use in your library for improved service delivery	3.00	1.23	2.60	1.22	2.8	Agreed
5	Webinar software which provides online platform to reach users for the purpose of giving effective service are in use in your library for improved service delivery	1.60	1.37	2.61	1.22	2.11	Disagreed
6	Social network websites technologies are in use in your library for improved service delivery	3.32	1.38	3.60	1.57	3.46	Agreed
<b>Average mean and standard deviation</b>		<b>2.31</b>	<b>1.05</b>	<b>2.61</b>	<b>1.30</b>		

**Table 2.** Mean and Standard Deviation Analysis of information Professionals in Federal University and State Universities on the extent to which information professionals utilize emerging technologies for improved service delivery in public university libraries in Rivers State.

S/N	Items	Information Professionals in Federal University		Information Professionals in State University		$\bar{X}_1, \bar{X}_2$	Remark
		$\bar{X}$	SD	$\bar{X}$	SD		
1	As an information professional, I utilised digital reference robots for improved service delivery	1.85	1.29	2.12	1.18	1.99	Very Low Extent
2	As an information professional, I utilized library automation SOUL software for improved service delivery	2.13	1.19	2.17	1.17	2.15	Low Extent
3	As an information professional, I utilized voice over Internet Protocols (VoIP) for sending voice in the form of digital packets over IP-based networks in the library for improved service delivery	1.83	1.32	1.85	1.29	1.84	Very Low Extent
4	As an information professional, I utilized video-based communication platforms like the Zoom and WebEx in the library for improved service delivery	2.72	1.94	2.50	1.82	2.61	Moderate Extent
5	As an information professional, I utilized webinar software which provides online platform to reach users for the purpose of giving effective service in the library	1.80	1.32	1.60	1.37	1.7	Very Low Extent
6	As an information professional, I utilized social network websites technologies in the library for improved circulation, reference and current awareness service delivery	3.12	1.28	2.60	1.22	2.86	High Extent
<b>Average mean and standard deviation</b>		<b>2.24</b>	<b>1.39</b>	<b>2.14</b>	<b>1.34</b>		

of 2.50 indicating that information professionals do not utilise digital reference robots, library automation SOUL software, Voice over Internet Protocols (VoIP) for sending voice in the form of digital packets over IP-based networks and webinar software to reach users to give effective service in the library.

### Discussion of Findings

The result of research question one revealed that social network website technologies and video-based communication platforms like Zoom and WebEx are in use in both Federal and State libraries. This finding agrees with the work of Jalal (2019) who also figured out some of the technologies in use including the use of OPAC, social network websites technologies and video-based communication platforms like the Zoom and WebEx, library automation SOUL software, and Barcode technology which play a prominent role

in making the delivery of library service to be more efficient and effective.

The study of research question two revealed that information professionals in both Federal and State Universities utilized video-based communication platforms like the Zoom and WebEx in the library and social network websites technologies in the library for improved circulation, reference and current awareness service delivery. This is in line with the work of Oyedokun, et al. (2018) who found out things information professionals can utilize in their cause of work to include Facebook, LinkedIn, Zoom, Twitter, yahoo and blogs respectively as social media tools and various search engines such as Google and Altavista. More so, Kumar (2017) also identified ICT as the use of video conferencing and internet, e-mails, fax, voicemail, telephone and remote control technology and library security including Radio Frequency

Identification (RFID), Quick Response (QR) Code, Technology Closed Circuit Television (CCTV), social network websites technologies and video-based communication platforms, as things to utilize in giving quality service.

## Conclusion

From the findings so far, it is very clear that many of the technological gadgets that are currently used in different libraries are not yet fully provided for use in these public University libraries in Rivers State and when some are even provided, the extent of utilization is still low. Therefore, information professionals are still negatively affected by giving quality services in the libraries because some of the gadgets that are to be used are unavailable for use and many professionals are not trained to use them. However, the study found that social network website technologies and video-based communication platforms like Zoom and WebEx are in use in both Federal and State libraries. It also showed that information professionals in both Federal and State Universities utilized video-based communication platforms like the Zoom and WebEx in the library and social network websites technologies in the library for improved circulation, reference and current awareness service delivery.

## Recommendations

Based on the findings of the study, the researchers recommended that:

1. University management should give the required attention to library use by encouraging the application of social network website technologies in the library for improved circulation, reference and current awareness service delivery to meet the demand of library users most especially in this period of post covid-19 pandemic.

2. There is a need for Library Department through the support of the universities to organize training for information professionals specifically on new gadgets and new ways of handling modern library services in other for them to give quality services. Provide and encourage the application of digital reference robots, library automation SOUL software and Voice over Internet Protocols (VoIP) and other current gadgets to be used to meet the demand of library users, most especially in this period of post covid-19 pandemic.

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**Corresponding Author**

Bernadette C. N. Ukaegbu  
bernadette.ukaegbu@gmail.com