

Awareness, Attitude and Use of High-End Technologies by University Librarians in Kwara State, Nigeria

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Abstract - The continued survival and use of university libraries in the present period depend on expanding and modernizing library and information services. The study examined awareness, attitude and use of high-end technologies by libraries in Nigerian Universities. The objectives of the study were to identify the types of high-end technologies available in Nigerian university libraries; determine if staff of Nigerian university libraries are aware of high-end technologies; investigate librarians' attitude towards high-end technology and ascertain if Nigerian university libraries use high-end technologies for service delivery. The study adopts a survey design of mixed method approach, and the population comprised of 40 respondents in three selected university libraries in Kwara State. A self-designed questionnaire was used for data collection, while the data collected were analyzed using descriptive statistic of frequency counts and percentage. Findings of the study revealed that university libraries now feature all-encompassing, user-friendly technology and service-driven techniques as a result of technological advancements, the study sheds light on librarian understanding, attitude, and use of cutting-edge technologies in university libraries in Kwara State, Nigeria. Only 6 of the 12 high-tech topics mentioned - RFID, IoT, institutional repositories, cloud computing, WEB 2.0/3.0, and WebOPAC - are thought to be well-known and in use. The study recommended that university management and library committee should provide adequate funding, thereby formulating policies addressing the installation and integration of high-end technologies in university libraries; there should be a public awareness campaign about the importance of high-end technologies in academic libraries; librarians should keep up with the latest trends to provide user-oriented services through adherence to these technologies in order to remain relevant in the profession and on the job, and that there should be constant user education on the importance of high-end technologies for both library staff and patrons.

Keywords: Attitude, Awareness, High-end Technologies, Library, Nigeria, Use

I. INTRODUCTION

Libraries play a prominent role in academic institution by providing access to information resources and services that stimulate learning, teaching and research activities in the institution. Hence, the success of any institution depends solely on its library. The library being the center of learning provides diverse services and resources for the dissemination of information. Academic libraries support

learning, teaching, and research activities of their parent bodies; they cater for the needs of the library users, not only for the needs but also in the conservation of knowledge (Singh, 2018).

Information and Communication Technology (ICT) has remained a catalyst in national development. Information as a resource is virtually limitless, and it is a critical tool for the growth of all sectors in any nation. As a result, the library resources must go a long way toward meeting the user's information needs. According to Vysakh (2020), it is worth noting that the rise of ICT has had a significant impact on the quality of information available through libraries. It also makes it possible to provide competent and adequate library services to library users from all disciplines.

Nigerian Information Specialists and Professionals are progressing in this age of globalization, according to Ajie (2019), so are the types of changes and problems they are confronted with. In today's quickly evolving information culture, libraries face both opportunities and threats. As a result of information technology, many changes have surfaced in the way information is located, obtained, processed, structured, communicated, and disseminated to library users, and new paradigm shifts are occurring in today's libraries and information centers. As information demands and seeking behaviors have become more sophisticated, as has the cost and quality of information, the transfer from paper to electronic medium (e-medium) is one of the most significant transformations.

Depending on certain theories, conventional (traditional) libraries will become extinct if they don't diversify their services and activities in response to new technology that make information available at the press of a button (Saibakumo, 2021). A hybrid library is one that combines traditional and electronic/virtual resources. Information experts now frequently refer to libraries as "Smart Libraries" (Gul and Bano, 2019) or "Intelligent libraries" (Cox, Pinfield and Rutter 2018) due to the incorporation of current technologies. Wenborn (2018) wrote in his blog post that library will be incorporated into the fundamental principles that govern society and that they will quickly

alter to accommodate new technological applications for teaching, learning, and research.

The emergence of the production, communication, and access to information technology, as well as its application, is based on the never-ending explosion of information in various ways, caused by globalization, privatization, and liberalization in all aspects of human life. This is the primary cause of the emergence of the production, communication, and access to information technology, as well as its application, giving rise to the various types of challenges faced by professionals. To meet these difficulties, modern librarianship's attitude and practices must shift from document guardian to information provider (Mittal, 2017). A paradigm shifts according to Funmilayo and Ayo (2020), has occurred in the way libraries use the traditional shophouse for provider access. Furthermore, the modern digital environment has changed the responsibilities and expectations of librarians, not only in terms of library and information services but also in terms of meeting their users' information needs.

A. Problem Statement

Due to the recent effects of information technology, the daily upheavals of human information seeking behavior, and the introduction of remote information access services from tech such as Google, libraries, despite their universal importance, are in danger of disappearing. As a result, it is critical that libraries broaden their horizons and incorporate as many practical and approachable technology-based services as those provided in university libraries across Nigeria. It is unclear whether libraries in underdeveloped nations have noticed the growing trend in libraries creating and implementing new technologies, the difficulties involved and the necessity to emulate.

There are not many studies on high-end technologies use in university libraries in Nigeria; those that exist are mostly reviews, subjective pieces, or non-empirical studies (Urhiewhu, Aji & Gogmin, 2015; Otunla 2016; Emiri 2019; Oluwole & Tella 2020). Omosor (2014) is one of the ones that is now available and just provided a broad report on new technologies. The paper by Chukwueke and Onuoha (2019) was also non-empirical and solely reviewed developing technologies. (Amogu and Okezie, 2019; Saibakumo, 2021) recently argued for the adoption of emerging technologies, although it's unclear if their arguments have been taken into account. This study is being done to find out how librarians feel about using these technologies and how they perceive them.

B. Objectives of the Study

The objectives of the study are to

1. Identify the types of high-end technologies available in university libraries in Kwara State;
2. Determine if university libraries in Kwara State are aware of high-end technologies;

3. Investigate librarians' attitude towards high-end technologies;
4. Ascertain if university libraries in Kwara State use high-end technologies for service delivery.

II. REVIEW OF LITERATURE

High-end technology is the technology that has reached the pinnacle of adoption (Cervone, 2010). These technologies provide solutions to a variety of issues, assist in the development of a variety of current facilities, and provide chances to create new ones. A variety of contributing variables is re-directing trends in information management and information services in new directions.

Volatile technologies, tech-savvy hyperactive user behavior, hyper-connected societies, liberalized access to information, re-defined data security, snowballing digitalization of business and administration at all levels, user-centric and user-driven content and services, and an online and collaborative learning environment are all factors influencing current trends (Mittal, 2017).

High-end technologies that have been introduced in libraries and information centers include Augmented Reality and Virtual Reality (Oyelude, 2017; Pope, 2018); Quick Respond Code Technology, Cloud Computing, Artificial Intelligence, Integrated Library Management Systems with an OPAC, and Social-media Applications (Oyelude, 2017; Pope, 2018), (Sheik and Olugbenga, 2019). According to Odeyemi (2019), (Massis, 2018; Gul and Bano, 2019), Artificial Intelligence and robotics are now being used in libraries for service delivery, making libraries smarter, boosting the potential of library employees, satisfying user needs, and closing information gaps, with a big and vast positive impact.

According to Saibakumo (2021), the rate of high-end technologies in university libraries is enormous. Librarians' awareness of high-end technologies that are useful in academic libraries is extremely high, with social media, Institutional Repositories, WebOPAC, Library Websites, Radio Frequency Identification (RFID), and the Internet of Things (IoT) being the most common, while Robotics, Artificial Intelligence, Google partnered libraries, Ready-to-Code Initiative, Digital Storytelling, and 3D/2D Digital printing were the least common because librarians are widely reckoned with.

This is made possible by librarians' exhaustive research, with a special focus on high-end technologies, and their involvement in discussions of high-end technologies in seminars and conferences, as access to publications about new technologies and recent developments on all library and information science platforms has necessitated this high level of awareness.

Academic institutions must be equipped with a digital environment that can be expanded using modern technical

resources and capabilities, such as the internet, to enable access through digital technologies (Makori and Mauti, 2016).

The library has improved the quality of information services, librarian image, librarian skills, academic transformation, and user-friendly satisfaction, transforming it into a learning and research center where users are no longer passive recipients of information but active participants in the information generation and dissemination process.

According to Saibakumo (2021), many high-end technologies (such as RFID, institutional repositories, library websites, social media, Internet of Things, use of Library Guide application, Integrated library management system, and WebOPAC for effective service delivery) and their relevance to university libraries are well-understood by Nigerian librarians, as it provides them with a platform where they can explore new opportunities and as well move with the latest trends thereby providing quality services and increasing users satisfaction. High-end technologies have also helped librarians upgrade their skillset and provide them the opportunity to acquire new knowledge (Neogi and Partap, 2019).

Librarians, according to Funmilayo and Ayo (2020), must improve themselves along with the system to provide user-oriented services by bonding to the latest online technologies used worldwide to provide library services, as any librarian who is unaware of trending problems and adoption of the newest technology will be redundant and left apart.

Many libraries in developed countries like Dubai Library, Rose Memorial Library, NY Public Library, and Florida Library have started to use drones as an effective tool for delivering books from library to patrons and vice versa, where users request books via mobile library app, concern sections receive and process the requests, the ordered book will then be checked and handed over to the drone section, drone pilot attaches the book and make it flies to the user doorstep and thereby flies back after delivery (Rouse, 2018).

Big data has a direct impact on libraries as the professionals use big data tools to analyze their large data like to know the users better and to provide services with full efficacy ((Sonawane and Sane, 2018). A library such as Harvard University Library as reported by Ball (2019), uses big data for data mining and text analytics for taking decisions, studying user behavior, developing library collections, and tracking the use of library materials.

The new library technologies are available and many more are constantly emerging as the name suggests. High-end for libraries is ubiquitous, libraries in developed countries are

leveraging high-end technologies to meet the needs of their users. Libraries in Nigeria as well, need to have the aspiration in adopting the High-end technologies, they need to assess and adopt these high-end technologies in order to promote their services. Scholars have identified different types of high-end technologies being used for libraries and library services.

Despite the challenges, there are so many high-end technologies that are adoptable by the Nigerian public libraries due to their simplicity, affordability and importance (Bichi 2021). They stated that libraries must have basic high-end technologies such as Wi-Fi, electronic resources, video conferencing, marker space and virtual reality facilities.

III. METHODOLOGY

The study adopted a case study method that combines both qualitative and quantitative data collection techniques. The qualitative data needed for the study was collected through a structured interview procedure where respondents were allowed to respond to a wide range of views on awareness, attitude and use of high-end technologies in university libraries.

Mixed methods can help you gain a more complete picture than a standalone quantitative or qualitative study, as it integrates benefits of both methods. Respondents were selected from three university libraries in Kwara State, (University of Ilorin Library, Kwara State University Library and Al-Hikmah Library respectively).

A total of 40 professional librarians were used (22 from Unilorin library, and 9 from KWASU library and 9 from Al-Hikmah University library respectively). Questionnaire was also used for data collections; the useful instruments return rate was 97.5%. Simple descriptive (mean, standard deviation, percentage and frequency counts) were used to analyze the collected data with Statistical Package for Social Science (SPSS v.23).

IV. RESULTS AND DISCUSSION

Table I shows the demographic information of respondents; it was discovered that majority of the respondents were male 21(53.8%). The table also reveals that majority of the respondents were staff of the University of Ilorin, Library with 22(56.4%), 26(66.7%) representing the majority of the respondents are MSC/MLS holders.

The findings also reveal that majority of the respondents have work experience ranging from 6 to 10 years, while 10(25.6%) representing majority of the respondents are Librarian II.

TABLE I DEMOGRAPHIC INFORMATION OF LIBRARIANS

Demographic Information		F	%
Gender of Respondents	Male	21	53.8%
	Female	18	46.2%
	Total	39	100.0%
Institution of Respondents	Unilorin	22	56.4%
	Kwasu	9	23.1%
	Al-Hikmah	8	20.5%
	Total	39	100.0%
Educational Qualification of Respondent	Bsc/Blis	8	20.5%
	Msc/MIs	26	66.7%
	Phd	5	12.8%
	Total	39	100.0%
Work Experience of Respondents	Below 5 Years	4	10.3%
	6-10 Years	17	43.6%
	11-15 Years	7	17.9%
	16- 20 Years	4	10.3%
	21 Years And Above	7	17.9%
	Total	39	100.0%
Cadre in Librarianship	University Librarian	1	2.6%
	Deputy University Librarian	3	7.7%
	Principal Librarian	3	7.7%
	Senior Librarian	9	23.1%
	Librarian I	9	23.1%
	Librarian II	10	25.6%
	Assistant Librarian	4	10.3%
	Total	39	100.0%

TABLE II RESPONSES ON AVAILABILITY OF HIGH-END TECHNOLOGIES

Sl. No.	Available Technologies	Available		Not Available		Mean	Std. Dev.
		F	%	F	%		
1	Internet of Things (IoT)	39	100.0%	0	0.0%	2.0000	.00000
2	Cloud Computing	38	97.4%	1	2.6%	1.9744	.16013
3	Artificial Intelligence (AI)	2	5.1%	37	94.9%	1.0513	.22346
4	Institutional Repository (IR)	39	100.0%	0	0.0%	2.0000	.00000
5	Augmented and Virtual Reality	1	2.6%	38	97.4%	1.0256	.16013
6	RFID	35	89.7%	4	10.3%	1.8974	.30735
7	Robotic	3	7.7%	36	92.3%	1.0769	.26995
8	WebOPAC	37	94.9%	2	5.1%	1.9487	.22346
9	WEB 2.0/3.0	29	74.4%	10	25.6%	1.7436	.44236
10	Big Data	19	48.7%	20	51.3%	1.4872	.50637
11	Drone	1	2.6%	38	97.4%	1.0256	.16013
12	Blockchain	1	2.6%	38	97.4%	1.0256	.16013

Table II shows the availability of high-end technologies in the libraries under study, the findings revealed that majority of the available high-end technologies were Internet of Things (IoT) and Institutional Repository with 39(100%), Cloud Computing with 38(97.4%), Radio Frequency Identification (RFID) with 35(89.7%), WebOPAC with 37(94.9%) and WEB 2.0/3.0 with 29(74.4%).

The findings contradict that of Odeyemi (2019), (Massis, 2018; Gul and Bano, 2019), which state that Artificial Intelligence and robotics are now being used in libraries for service delivery, making libraries smarter, boosting the potential of library employees, satisfying user needs, and closing information gaps, with a big and vast positive impact.

A. Availability of High-End Technologies

Respondents in university libraries were asked to indicate the available high-end technologies. From the interview conducted, majority of the respondents indicated that the available technologies are Internet of Things (IoT), Cloud Computing, Institutional Repository, and RFID, while some respondents indicated that WebOPAC, Institutional Repository and RFID are available in their libraries. A respondents pointed out that “High-end technology in Nigerian University libraries is an evolving facility that should be given utmost consideration so as to move the dissemination of information and services to the point that users will not just be at the receiving end, but also an active participant in the service delivery process.”

TABLE III RESPONSE ON STAFF AWARENESS OF HIGH-END TECHNOLOGIES

Sl. No.	Awareness	Aware		Not Aware		Mean	Std. Dev.
		F	%	F	%		
1	Internet of Things	39	100.0%	0	0.0%	2.0000	.00000
2	Cloud Computing	38	97.4%	1	2.6%	1.9744	.16013
3	Artificial Intelligence	8	20.5%	31	79.5%	1.2051	.40907
4	Institutional Repository	39	100.0%	0	0.0%	2.0000	.00000
5	Augmented and Virtual Reality	11	28.2%	28	71.8%	1.2821	.45588
6	RFID	32	82.1%	7	17.9%	1.8205	.38878
7	Robotic	6	15.4%	33	84.6%	1.1538	.36552
8	WebOPAC	37	94.9%	2	5.1%	1.9487	.22346
9	WEB 2.0/3.0	29	74.4%	10	25.6%	1.7436	.44236
10	Big Data	13	33.3%	26	66.7%	1.3333	.47757
11	Drone	5	12.8%	34	87.2%	1.1282	.33869
12	Blockchain	5	12.8%	34	87.2%	1.1282	.33869

Table III shows the results of the analysis of staff awareness of high-end technologies, it was revealed that, majority of the respondents were aware of the Internet of Things and Institutional Repository with 39(100%), 38(97.4%) of the respondents are aware of Cloud Computing, 37(94.4%) of the respondents are aware of WebOPAC, 32(82.1%) of the respondents are aware of RFID and 29(74.4%) of the respondents are aware of WEB 2.0/3.0. However, 31(79.5%) of the respondents are not aware of Artificial Intelligence, 28(71.8%) of the respondents are not aware of Augmented and Virtual Reality, 33(84.6%) of the respondents are not aware of Robotic, 26(66.7%) of the respondents are not aware of Big Data and 34(87.2%) of the respondents are also not aware of Drone and Blockchain respectively.

The result is in alignment with the assertion of Saibakumo (2021), which states that Librarian’s awareness of high-end technologies that are useful in academic libraries are enormous with social media, Institutional Repositories, WebOPAC, Radio Frequency Identification (RFID), and the Internet of Things being the commonest while Robotics,

Artificial Intelligence, Google partnered libraries, Ready-to-Code Initiative, Digital Storytelling, and 3D/2D Digital printing were the least common.

B. Awareness of High-End Technologies

Librarians in the university libraries under study were asked if they are aware of the existence of these high-end technologies. from the conducted interview, majority of the respondents are aware of RFID, IoT, Cloud Computing, Institutional Repository, Drones and WebOPAC. One of the respondents stressed that “Although most of these technologies are not fully used in Nigerian University libraries, but the level of awareness of librarians are second to none, because the issue and prospects of such technologies has been a point of discussion at associations, seminars, and conferences.”

Table IV reveal librarians attitude toward high-end technologies, the findings reveal that majority of the respondents with 39(100%) agree that they advantageous attitude towards high-end technologies, they agree that it is

a good idea to use high-end technologies for quality service delivery, they as well agree to the assertion that librarians derive pleasure in using high-end technologies, they also agree that the usage of high-end technologies will allow them to acquire new knowledge and also allow for increase user satisfaction, 38(97.4%) of the respondents agree that they feel confident in using high-end technologies. 1(2.6%)

of the respondents agree that they will never use high-end technologies and that they dislike the idea of using high-end technological facilities, 2(5.1%), agree that using high-end technologies is a foolish idea, while 10(25.6%) of the respondents agree that they feel intimidated by high-end technology complexity.

TABLE IV RESPONSES ON THE ATTITUDE OF LIBRARIANS TOWARDS HIGH-END TECHNOLOGIES

Sl. No.	Attitude	Agree		Disagree		Mean	Std. Dev
		F	%	F	%		
1	I have an advantageous attitude toward using high-end technologies	39	100.0%	0	0.0%	2.0000	.00000
2	It is a good idea to use high-end technologies for quality service delivery	39	100.0%	0	0.0%	2.0000	.00000
3	I derive pleasure in using high-end technologies	39	100.0%	0	0.0%	2.0000	.00000
4	I believe the usage of high-end technologies Will allow me to acquire new knowledge	39	100.0%	0	0.0%	2.0000	.00000
5	High-end technologies allow for increased user satisfaction	39	100.0%	0	0.0%	2.0000	.00000
6	I feel confident in using high-end technologies	38	97.4%	1	2.6%	1.9744	.16013
7	I will never use high-end technologies	1	2.6%	38	97.4%	1.0256	.16013
8	I dislike the idea of using high-end technology facilities	1	2.6%	38	97.4%	1.0256	.16013
9	I feel intimidated by high-end technology complexity	10	25.6%	29	74.4%	1.2564	.44236
10	Using high-end technology is a foolish idea	2	5.1%	37	94.9%	1.0513	.22346

The results of these findings are supported by that of Saibakumo (2021), that Nigerian librarians better understood high-end technologies and their relevance as it provides them with a platform where they can explore new opportunities and as well move with the latest trends, thereby providing quality services and increasing user satisfaction. The findings also agree with Neogi and Partap (2019), who states that high-end technologies help librarians upgrade their skillset and provide them the opportunity to acquire new knowledge.

C. Attitude of Librarians towards High-End Technologies

Respondents in the university libraries under study were asked the attitudes of librarians towards High-end technologies, from the interviewee’s perspectives it is observed that while some librarians embrace these technological facilities, some of them see it as a threat to their job and that it could take over their job in the nearest future.

TABLE V RESPONSES ON THE USED HIGH-END TECHNOLOGIES FOR SERVICE DELIVERY

Sl. No.	Used Technologies	Used		Not Used		Mean	Std. Dev
		F	%	F	%		
1	Internet of Things	35	89.7%	4	10.3%	1.8974	.30735
2	Cloud Computing	37	94.9%	2	5.1%	1.9487	.22346
3	Artificial Intelligence	5	12.8%	34	87.2%	1.1282	.33869
4	Institutional Repository	33	84.6%	6	15.4%	1.8462	.36552
5	Augmented and Virtual Reality	1	2.6%	38	97.4%	1.0256	.16013
6	RFID	29	74.4%	10	25.6%	1.7436	.44236
7	Robotic	2	5.2%	37	94.8%	1.0513	.22346
8	WebOPAC	37	94.9%	2	5.1%	1.9487	.22346
9	Web 2.0/3.0	28	71.8%	11	28.2%	1.7179	.45588
10	Big Data	9	23.1%	30	76.9%	1.2308	.42683
11	Drone	1	2.6%	38	97.4%	1.0256	.16013
12	Blockchain	1	2.6%	38	97.4%	1.0256	.16013

Table V shows the high-end technologies used for service delivery in the libraries under study, the findings reveal that majority of the respondents with 37(94.9%) indicated that Cloud Computing and WebOPAC are used for service delivery, 35(89.7%) of the respondents indicated that Internet of Things is used for service delivery, 33(84.6%) of the respondents indicated that Institutional Repository is used for service delivery, 29(74.4%) of the respondents indicated that RFID is used for service delivery and 28(71.8%) of the respondents indicated that Web2.0/3.0 are used for service delivery. While the not used high-end technologies for service delivery according to the findings are Big Data with 30(76.9%), Artificial Intelligence with 34(87.2%), Robotic with 37(94.8%), and Augmented and Virtual Reality, Drone and Blockchain with 38(97.4%) respectively.

The findings dissent with that of Rouse (2018), which states that libraries such as Dubai Library, Rose Memorial Library, NY Public Library, and Florida Library have started to use drones as an effective tool for delivering books from library to patrons and vice versa, where users request for books via mobile library app, concern sections receive and process the requests, the ordered book will then be checked and handed over to the drone section, drone pilot attaches the book and make it flies to the user doorstep and thereby flies back after delivery. The results further disagree with that of Ball (2019), who reported that Libraries such as Harvard University Library use Big Data for data mining and text analytics for taking decisions, studying user behavior, developing library collections, and tracking the use of library materials. It can then be concluded that existing theories focus more on the use of these technologies in libraries in the developed world as compared to libraries in developing countries.

D. Used High-End Technologies for Service Delivery

Respondents in the libraries under study were asked the High-end technologies that are used for service delivery, and from the responses gathered, majority of the respondents stressed that RFID, WebOPAC, Institutional Repository, WEB 2.0/3.0, Cloud Computing, are high-end technologies used for service delivery in the library under study.

V. SUMMARY OF FINDINGS

1. Available high-end technologies in university libraries in Kwara State are Internet of Things, Institutional Repository, Cloud Computing, RFID, WebOPAC, and WEB 2.0/3.0.
2. University libraries in Kwara State are aware of IoT, IR, Cloud Computing, RFID, WebOPAC and WEB 2.0/3.0
3. University librarians in Kwara State have positive attitude towards high-end technologies.
4. Internet of Things (IoT), Institutional Repository (IR), Cloud Computing, RFID, WebOPAC and WEB 2.0/3.0

are high-end technologies used for service delivery in university libraries in Kwara State.

VI. CONCLUSION AND RECOMMENDATIONS

Hard to soft and print to digital conversions happen quickly, depending on the situation. To emphasize the idea that this transformation is essentially uncontrollable by obvious elements like the management system of libraries, the demand for library users is also changing, literally replicating the changing global environmental conditions. The study carefully investigated the awareness, attitude and use of high-end technologies by university libraries in Kwara State.

Based on the findings the following recommendations were made.

1. Academic management and library committee should provide adequate funding, thereby formulating policies addressing the installation and integration of high-end technologies in academic libraries.
2. There should be a public awareness campaign about the importance of high-end technologies in university libraries.
3. Librarians should keep up with the latest trends to provide user-oriented services through adherence to these technologies in order to remain relevant in the profession and on the job.
4. There should be constant user education on the importance of high-end technologies for both library staff and patrons.

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