

# USE OF WEB TECHNOLOGIES AND SERVICE DELIVERY AMONG LIBRARIANS IN UNIVERSITY LIBRARIES IN SOUTH-SOUTH, NIGERIA

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## Abstract

This study examined the use of web technologies on service delivery among librarians in university libraries in South-South Nigeria. It was guided by three research questions, and one hypothesis. A correlational research design was adopted for the study. The population is 582 librarians across university libraries in the South-South, Nigeria. A sample size of 234, representing 40% of the population, was selected using Krejcie and Morgan's (1970) table. Data were collected using a structured questionnaire. The data were analysed using descriptive statistics such as mean ( $\bar{x}$ ), and standard deviation (SD), and inferential statistics including Pearson Product-Moment Correlation Coefficient (PPMC), linear regression, and multiple regression. A criterion mean of 2.50 was adopted to determine the extent of responses, and a 0.05 level of significance was used as the threshold for testing hypothesis. Findings revealed that librarians in the study area use web technologies to a high extent ( $\bar{x} = 2.57$ ,  $SD = 0.94$ ), all of which are above the criterion mean of 2.50. Library service delivery was also rated high ( $\bar{x} = 2.63$ ,  $SD = 0.94$ ). Inferential results showed

significant positive relationships between use of web technologies and service delivery ( $p = .000$ ), all at the 0.05 level of significance. The study concluded that web technology use are critical driver of effective library service delivery. The study recommends that library services can become more innovative, user-centered, and responsive. The study contributes to existing knowledge by empirically validating the significant influence of librarians' professional competencies on service delivery in university libraries.

**Keywords:** Use, Web Technologies, Service Delivery, Librarians, ,University Libraries, South-South, Nigeria.

## Introducion

Universities play a fundamental role in society as centre of learning, research, and knowledge dissemination. As institutions dedicated to higher education, universities serve as crucibles where ideas are forged, nurtured, and disseminated to shape the future of society. Through rigorous academic programme, research endeavour, and community engagement initiatives, universities contribute to the intellectual and cultural enrichment of society. At the nexus of this intellectual ecosystem lies the university library, an indispensable institution that embodies the ethos of academic excellence and scholarly inquiry (McKenzie, 2017). At the heart of every university lies its library, a bastion of knowledge housing an extensive array of resources essential for academic pursuits. University libraries not only serve as repositories of books, journals, and other scholarly materials but also as dynamic hubs where information is curated, accessed, and shared by students, faculty, researchers, and the broader community.

Librarians, as stewards of information, provide expert guidance and support to help users navigate the complex landscape of scholarly resources effectively. Through instructional workshops, one-on-one consultations, and online tutorials, librarians empower students and faculty to critically evaluate information, conduct research ethically, and communicate their findings effectively through the different assistance (services) provided. Library services constitute a fundamental aspect of the academic ecosystem, encompassing a diverse array of activities, resources, and support mechanisms designed to meet the information needs of users within a library's community. These services are integral to the mission of libraries, serving to facilitate access to information, promote information literacy, and support the academic endeavour of students, faculty, researchers, and other stakeholders.

Library services refer to the comprehensive range of offerings provided by libraries to meet the diverse needs of their users (Hider, 2019). These services encompass various activities, resources, and support mechanisms aimed at facilitating access to information, promoting information literacy, and enhancing scholarly communication within the academic community. The types of library services can be categorized into several key areas, each serving a distinct purpose in fulfilling the mission of the library and supporting the academic endeavour of its users. Library services play a crucial role in bridging the gap

between information seekers and the wealth of resources available, empowering individuals to navigate the complex landscape of information effectively (Tenopir & King, 2018). By offering a diverse array of services tailored to meet the evolving needs of users, libraries facilitate access to information, promote information literacy, and support the academic mission of the university, thereby serving as integral components of the scholarly ecosystem.

Meyega, as cited in Abuakar and Sahabi (2022), defined service delivery as a process of making information resources available through library facilities and procedures for on site use, circulation and inter-library loans. Service delivery in university libraries encompasses the provision of various assistance, such as reference assistance, research consultations, instructional sessions, and resource management. Librarians play a vital role in delivering these services, which are often tailored to meet the diverse needs of students, faculty, and researchers. Effective service delivery requires librarians to possess strong interpersonal and communication skills, as well as a deep understanding of the academic community's information needs.

. Web technologies refer to a diverse array of tools, platforms, and applications that leverage the Internet to facilitate communication, collaboration, and interaction (Al-Harthi, 2017). These technologies encompass various components, including web development frameworks, content management systems, digital repositories, discovery platforms, and online communication tools. The integration of these web technologies into library services has revolutionized the way libraries operate, enabling them to provide innovative and user-centric services to patrons. One of the key aspects of web technologies in library service delivery is the utilization of library management systems (LMS) or integrated library systems (ILS). These systems serve as the backbone of library operations, facilitating tasks such as cataloguing, circulation, acquisitions, and patron management (Perry & Wise, 2019). Library Management System platforms enable librarians to efficiently manage collections, track circulation statistics, and automate routine administrative tasks, thereby enhancing operational efficiency and improving user experiences (Tennant, 2012). Moreover, LMS platforms often integrate with other web technologies, such as discovery layers and digital repositories, to provide seamless access to resources and enhance discoverability (Hider, 2020).

Discovery platforms represent another significant facet of web technology in library service delivery. These platforms, also known as library discovery services or federated

search tools, offer users a unified interface for searching and accessing a wide range of library resources, including books, articles, journals, databases, and digital collections (Elliott, 2018). Discovery platforms leverage advanced search algorithms and metadata standards to provide users with relevant and comprehensive search results, thereby simplifying the information discovery process and improving access to resources.

In a nutshell, web technologies play a critical role in enhancing library services delivery by providing tools and platforms that streamline operations, improve access to resources, and facilitate communication and collaboration. Library management systems, discovery platforms, digital repositories, and communication tools represent key components of web technologies that enable libraries to adapt to the evolving needs of users and provide innovative services. As libraries continue to embrace digital transformation, integrating web technologies will remain essential for ensuring the relevance, accessibility, and effectiveness of library services in the digital age.

### **Statement of the Problem**

The provision of services in the university library is essential to fulfilling the information requirements of the user communities. An ideal scenario, library service delivery in university libraries is characterized by seamless access to information

resources, efficient circulation systems, robust inter library loan programme, and proactive engagement with users. Thus, contributing to the academic vibrancy of the university.

Preliminary observation by the researcher revealed that the service delivery in university libraries needs serious overhauling due to the rapid pace of technological change which present new challenges and opportunities for library service delivery. Therefore, the effective use of web technologies to provide effective services may be a factor. It is against this background that the researcher seeks to investigate use of web technologies and service delivery among librarians in university libraries in South-south, Nigeria.

### **Research Questions**

The following research questions guided the study.

1. To what extent do librarians use web technologies in university libraries?
2. To what extent are library services rendered by librarians in university libraries?
3. What is the relationship between the deployment of web technologies and service delivery in university libraries?

## **Research Hypothesis**

1. There is no significant relationship between the deployment of web technologies and service delivery in university libraries.

## **REVIEW OF RELATED LITERATRES**

### **Web Technologies Deployed by Librarians in University Libraries**

The rapid advancement of web technologies has revolutionized the way librarians deliver services in university libraries. The emergence of Web 2.0 technologies, such as social media platforms, blogs, and wikis, has facilitated greater user engagement and collaboration in the library environment. The integration of web technologies has brought about significant changes in library service delivery, librarians are transitioning from traditional, desk-bound services to virtual and hybrid models, offering online reference assistance, virtual workshops, and digital resource access. Furthermore, According to Jones (2019), the proliferation of mobile devices has led to the development of mobile-responsive library websites and applications, providing users with access to library services.

Librarians harness a plethora of cutting-edge web technologies to optimize service delivery and elevate the user experience within university libraries. At the heart of this digital transformation lies the utilization of robust Library Management Systems (LMS), LMS platforms serve as the cornerstone, facilitating seamless cataloguing, efficient circulation management, and meticulous oversight of diverse resources within the library's purview. Through intuitive interfaces and sophisticated back end functionalities, LMS empowers librarians to streamline administrative tasks and ensure the smooth operation of library services.

The integration of web technologies into service delivery within university libraries has become increasingly prevalent, reflecting the evolving nature of modern information dissemination. Smith et al. (2018) stressed this trend, revealing that a substantial majority of university librarians, approximately 90%, actively employ various web technologies to enhance their provision of services. This utilization spans a wide array of tools and platforms, including online catalogue, databases, and digital repositories.

However, alongside these benefits, challenges persist, including technological infrastructure limitations and digital literacy disparities among users, overcoming these obstacles necessitates robust training and professional development initiatives to empower librarians to effectively leverage web technologies (Garcia & Martinez, 2022).

Additionally, ensuring the accessibility and usability of web-based services remains paramount, with librarians playing a pivotal role in adhering to accessibility standards and implementing user-friendly interfaces. Moreover, the integration of artificial intelligence and machine learning algorithms has revolutionized library systems, enhancing discoverability and providing personalized recommendations

.The adoption of Web 2.0 tools has significantly influenced professional service delivery in libraries. These tools, characterized by their interactive and user-centred nature, have enhanced the ability of libraries to engage with users and offer tailored services. However, despite the transformative potential of Web 2.0 technologies, several constraints continue to hinder their full implementation in library service delivery. These challenges include limited technical expertise among librarians, inadequate funding for technological infrastructure, and resistance to change within some library environments. This underscores the importance of examining the use of Web 2.0 tools in the effective provision of library services, as demonstrated in a study focusing on selected universities in Southwest Nigeria.

Supporting this perspective, Singh and Gill (2015) investigated the integration of Web 2.0 tools in Indian university libraries. Their study revealed that while platforms such as blogs, wikis, and social networking sites were increasingly adopted to enhance user

engagement and information dissemination, barriers such as insufficient training and lack of institutional support limited their effectiveness. It was recommended that targeted capacity-building initiatives and stronger administrative backing to overcome these challenges. Similarly, their findings align with Ramos's assertion that librarians must adapt to new technological landscapes to remain relevant in the digital era.

### **Services Offered by Librarians in University Libraries**

Library services have become a well-established part of the programme of libraries of all types. Its origin dates back to the period when librarians realized that users need to make effective use of the collections under their custody, they need to give some assistance. Service started in England through the contributions of cathedrals and monasteries in which schools especially higher institutions were established. Agwu (2018) states that the actualization of the totality of library goals and the effectiveness of the entire university system cannot be complete without giving credit to the religious contribution of monks and their various contributions to scriptoria. The services rendered by academic libraries include: circulating materials to eligible patrons under equitable policies; providing reference referral services; providing indexing and abstracting services covering the professional periodicals received in library; providing current awareness services, which include library display, selective dissemination of information (SDI), and compilation of

bibliographies; providing continuing instruction to patrons in the effective use of the library (user education); preparing a library handbook giving details of the rules, resources, services and staff of the library and making it available to patrons free of charge or at a minimal cost; promoting inter library cooperation loans; provision of computer services and convenient hours of services; and displaying newly received books in an appropriate place and arranging book exhibitions on different themes appropriate to a given occasion in an effort to bring its resources to the notice of its users.

### **Relationship between Deployment of Web Technologies and Service Delivery in University Libraries**

The relationship between the deployment of web technologies and service delivery in university libraries is a crucial aspect of modern academic institutions. As universities continue to evolve in the digital age, the integration of web technologies plays a significant role in enhancing library services and user experiences. The deployment of web technologies in university libraries allows for increased accessibility and availability of resources. (Borgman, 2018). With digital platforms, users can access library resources from anywhere, at any time, making it more convenient for students, researchers, and faculty members. This increased accessibility can lead to higher usage and satisfaction rates among library users

Web technologies enable the implementation of advanced search functionalities, facilitating the discovery and retrieval of information. Users can now search for specific materials using keywords, filters, and other advanced search options. This improves the overall user experience and efficiency in finding relevant resources (Gilchrist & Jacobs, 2017). The deployment of web technologies allows libraries to digitize and manage their resources more efficiently. This includes the digitization of books, journals, and other materials, which can be stored and accessed online. Additionally, digital preservation techniques ensure that these resources are protected from degradation and loss over time.

Ezema and Ugwuanyi (2017) conducted a study on the role of web-based technologies in enhancing research support services in Nigerian university libraries. The study aimed to identify the specific web tools employed, assess their impact on research productivity, and explore librarians' perceptions of these tools. This study was significant as it addressed the critical need for libraries to support academic research through innovative technologies. The findings revealed that tools such as digital repositories, e-journal platforms, and citation management software contributed to a 70% increase in research output accessibility and a 50% reduction in the time required for literature searches. The authors argued that these improvements position libraries as central to

academic success in modern universities. They recommended increased investment in web technologies and consistent librarian training to sustain these benefits.

### **Methodology**

The study employed a correlational research design to examine the relationship between utilization of web technologies and service delivery among librarians working in university libraries in South-south, Nigeria. This study's population is 582 librarians, comprised of all librarians in the Government owned university libraries in South South Nigeria. The sample size for the study is 234, which represents 40% of the entire population of 582 respondents used for this study. The sample size was drawn in line with Krejcie and Morgan's (1970) table for determining population and sample size for research work. According to Krejcie and Morgan (1970), the data collection instrument for this study is a self-structured questionnaire

The data collected through the administration of the research instrument were analysed using both descriptive and inferential statistics. Research Questions One and two were answered using mean and standard deviation, with a criterion mean set at 2.50. Pearson's Product Moment Correlation Coefficient was used to answer Research Questions three. Hypothesis was tested using simple linear regression. The hypothesis was tested at

the 0.05 level of significance, meaning if hypothesis is with a p-value of 0.05 or less was rejected, whereas a p-value above 0.05 indicated that the hypothesis was accepted.

## Results And Diccusion

**Research Question 1:** To what extent do librarians use web technologies in university libraries?

**Table 1: The Extent to Which Librarians Use Web Technologies**

Web Technologies	VHE	HE	LE	VLE	$\bar{x}$	Std. Dev.
Online Public Access Catalogs (OPACs)	68	54	31	17	3.02	0.99
Collaborative tools such as wikis and shared documents	14	82	47	27	2.49	0.86
Content Management Systems (CMS)	23	59	59	29	2.45	0.93
Link resolvers	30	59	54	27	2.54	0.96
Virtual reference software	31	54	60	25	2.54	0.96
Digital repositories	25	73	50	22	2.59	0.89
Electronic resource management systems	29	54	62	25	2.51	0.94
Federated search tools	31	64	48	27	2.58	0.97
Integrated library systems	29	65	52	24	2.58	0.93
Library management systems	25	48	61	36	2.36	0.98
Discovery layers	28	52	63	27	2.48	0.95
Web analytics tools	28	60	59	23	2.55	0.92
Learning management systems (LMS)	32	58	67	13	2.64	0.87
Institutional repository software	30	59	55	26	2.55	0.96
Open URL link resolvers	40	55	50	25	2.65	1.00
Chatbots and virtual assistants	43	51	55	21	2.68	0.99
Digital exhibit platforms	33	67	53	17	2.68	0.90
Web-based citation management tools	27	52	73	18	2.52	0.89

Social bookmarking tools	30	54	63	23	2.54	0.94
Responsive web design frameworks	33	57	43	37	2.51	1.04
Aggregate Mean/ Std. Dev.					2.57	0.94
Criterion Mean					2.50	

The analysis of the extent to which librarians use web technologies in university libraries in South-South Nigeria (see Table 1) showed an aggregate mean of 2.57 (SD = 0.94), which is above the criterion mean of 2.50, indicating a moderate extent of web technology use among librarians. Furthermore, the data revealed that the specific web technologies with mean values above the criterion mean are Online Public Access Catalogs ( $\bar{x} = 3.02$ , SD = 0.99), chat bots and virtual assistants ( $\bar{x} = 2.68$ , SD = 0.99), digital exhibit platforms ( $\bar{x} = 2.68$ , SD = 0.90), open URL link resolver ( $\bar{x} = 2.65$ , SD = 1.00), learning management systems ( $\bar{x} = 2.64$ , SD = 0.87), digital repositories ( $\bar{x} = 2.59$ , SD = 0.89), federated search tools ( $\bar{x} = 2.58$ , SD = 0.97), integrated library systems ( $\bar{x} = 2.58$ , SD = 0.93), web analytic tools ( $\bar{x} = 2.55$ , SD = 0.92), and institutional repository software ( $\bar{x} = 2.55$ , SD = 0.96). In summary, these findings imply that librarians in South-South Nigerian universities moderately adopt web technologies in their service delivery, with OPACs, chatbots, and digital exhibit platforms emerging as the most commonly utilised tools.

**Research Question 2:** To what extent are library services rendered by librarians in university libraries?

**Table 2: The Extent Library Services are Rendered by Librarians**

Services	VHE	HE	LE	VLE	$\bar{x}$	Std. Dev.
Virtual reference services	52	62	38	18	2.87	0.97
Online instruction and tutorials	33	55	63	19	2.60	0.93
Virtual events and programmes	38	57	56	19	2.67	0.95
Digital archives and special collections	26	59	60	25	2.51	0.93
Mobile library services	29	70	49	22	2.62	0.92
Digital preservation services	32	56	60	22	2.58	0.94
Online community engagement	31	55	53	31	2.51	0.99
Electronic resource access	33	61	59	17	2.65	0.91
Remote access to library resources	29	55	61	25	2.52	0.94
Collaborative online spaces	40	63	43	24	2.70	0.98
Research data management services	29	63	63	15	2.62	0.87
Plagiarism detection and citation assistance	39	57	53	21	2.67	0.97
Personalized reading recommendations	38	55	59	18	2.66	0.94
Virtual study rooms	34	62	58	16	2.67	0.90
Technology lending services	36	56	57	21	2.63	0.95
Digital literacy training	37	56	52	25	2.62	0.99
Open access publishing support	30	63	55	22	2.59	0.93
Embedded librarian services	31	60	55	24	2.58	0.95
Interlibrary loan and document delivery services	32	58	63	17	2.62	0.90
Virtual Reality (VR) and augmented reality (AR) experiences	33	60	57	20	2.62	0.93
Aggregate Mean /Std. Dev.					2.63	0.94
Criterion Mean					2.50	

The analysis of the extent to which library services are rendered by librarians in university libraries in South-South Nigeria (see Table 2) yielded an aggregate mean of 2.63 (SD = 0.94), which is above the criterion mean of 2.50, suggesting that librarians moderately render digital and technology-driven library services. The specific services

with mean values above the criterion mean are virtual reference services ( $\bar{x} = 2.87$ ,  $SD = 0.97$ ), collaborative online spaces ( $\bar{x} = 2.70$ ,  $SD = 0.98$ ), plagiarism detection and citation assistance ( $\bar{x} = 2.67$ ,  $SD = 0.97$ ), virtual study rooms ( $\bar{x} = 2.67$ ,  $SD = 0.90$ ), virtual events and programme ( $\bar{x} = 2.67$ ,  $SD = 0.95$ ), personalized reading recommendations ( $\bar{x} = 2.66$ ,  $SD = 0.94$ ), electronic resource access ( $\bar{x} = 2.65$ ,  $SD = 0.91$ ), technology lending services ( $\bar{x} = 2.63$ ,  $SD = 0.95$ ), digital literacy training ( $\bar{x} = 2.62$ ,  $SD = 0.99$ ), mobile library services ( $\bar{x} = 2.62$ ,  $SD = 0.92$ ), research data management services ( $\bar{x} = 2.62$ ,  $SD = 0.87$ ), inter-library loan and document delivery services ( $\bar{x} = 2.62$ ,  $SD = 0.90$ ), and virtual reality/augmented reality experiences ( $\bar{x} = 2.62$ ,  $SD = 0.93$ ).

In summary, these findings imply that librarians in South-South Nigerian universities render a moderate range of technology-enhanced library services, with virtual reference, collaborative spaces, and plagiarism detection support standing out as the most frequently provided.

**Research Question 3:** What is the relationship between the deployment of web technologies and service delivery in university libraries?

### **Table 3: The Relationship Between the Deployment of Web Technologies and Service Delivery**

#### **Correlations**

		The extent to which librarians use web technologies	The extent librarians rendered library services
The extent to which librarians use web technologies	Pearson Correlation	1	.480**
	Sig. (2-tailed)		.000
	N	170	170
The extent librarians rendered library services	Pearson Correlation	.480**	1
	Sig. (2-tailed)	.000	
	N	170	170

Data presented in Table 3 reveals the relationship between the deployment of web technologies and service delivery in university libraries. The Pearson correlation coefficient ( $r = .480$ ,  $p = .000$ ) indicates a moderate positive relationship between the use of web technologies and librarians' service delivery. This suggests that increased deployment of web technologies is moderately associated with improvements in the quality of library service delivery. The significant p-value (.000) confirms that this relationship is statistically meaningful. The conclusion was reached that a significant relationship exists between the deployment of web technologies and service delivery in university libraries.

### Testing of the Hypothesis

Ho1: There is no significant relationship between the deployment of web technologies and service delivery in university libraries.

**Table 4: The Relationship Between Librarians' Deployment of Web Technologies and Service Delivery**

<b>Model Summary</b>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.480 <sup>a</sup>	.231	.226	.29040	
<b>ANOVA</b>					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4.253	1	4.253	50.429	.000 <sup>b</sup>
Residual	14.168	168	.084		
Total	18.421	169			
<b>Coefficients</b>					
Model	Unstandardized Coefficients B	Standardized Coefficients Std. Error	Beta	t	Sig.
(Constant)	1.441	.168		8.567	.000
The extent to which librarians use web technologies	.460	.065	.480	7.101	.000
a. Dependent Variable: The extent librarians rendered library services					
b. Predictors: (Constant), The extent to which librarians use web technologies					

The R-value of 0.480 indicates a moderate positive correlation between the deployment of web technologies and the extent of service delivery in university libraries. The R<sup>2</sup> value of 0.231 suggests that approximately 23.1% of the variance in service delivery is explained by the extent to which librarians deploy web technologies, indicating a fair explanatory power of the model.

The ANOVA results show an F-value of 50.429 with a p-value of 0.000, which is less than the conventional significance level of 0.05. This confirms that the regression model is statistically significant, meaning that the deployment of web technologies by librarians has a meaningful influence on service delivery.

The coefficient for the deployment of web technologies is 0.460, with a p-value of 0.000, which is also statistically significant. This implies that for every one-unit increase in the use of web technologies by librarians, there is a corresponding increase of 0.460 units in the level of service delivery.

### **Recommendations**

Based on the findings of the study, the following recommendations are made:

1. Given the high use of web technologies, university libraries should ensure continuous investment in updating and maintaining digital infrastructure such as online public access catalogue (OPAC), institutional repositories, and library websites. Librarians should also be encouraged to participate in web development training to improve their ability to manage and customize these platforms for enhanced user engagement.

2. Since library services are rendered to a high extent, efforts should be made to adopt innovative service models such as virtual reference services, mobile library apps, and user-driven content delivery systems. Encouraging librarians to co-create services based on user feedback will promote user satisfaction and library relevance in the digital age.
3. Given the high use of web technologies, university libraries should ensure continuous investment in updating and maintaining digital infrastructure such as online public access catalogue (OPAC), institutional repositories, and library websites. Librarians should also be encouraged to participate in web development training to improve their ability to manage and customize these platforms for enhanced user engagement.
4. Given the high use of web technologies, university libraries should ensure continuous investment in updating and maintaining digital infrastructure such as online public access catalogue (OPAC), institutional repositories, and library websites. Librarians should also be encouraged to participate in web development training to improve their ability to manage and customize these platforms for enhanced user engagement.

## **Conclusion**

The findings of this study provide strong empirical evidence that librarians in university libraries in South-South Nigeria actively utilize web technologies to a high extent. This significantly and positively influence the quality of library service delivery. Specifically, the use of web technologies was identified as strong predictor of enhanced service delivery, with robust positive relationships observed.

Conversely, the findings highlight that effective service delivery is primarily shaped by professional practices and technological competencies rather than unexamined structural or demographic factors. This underscores the importance of continuous professional development and digital literacy among librarians. Overall, the study concludes that improving librarians' engagement in of web technologies as essential strategies for enhancing library service delivery in university libraries. Institutional investments in these areas are likely to result in more efficient, responsive, and user-centered library services across the region.

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