Availability and Utilization of Web Technology Tools for Services Delivery in Public Libraries in Nigeria

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ABSTRACT

The study examined the availability and utilization of web technology tools for services delivery in public libraries in Nigeria. Four objectives guided the study. The descriptive survey research design was used for this study. The population of this study comprised of 3160 public librarians in the 316 public libraries nationwide, comprising 37 state libraries (one per state), 253 branches, and 25 national library branches. The research used the purposive sample techniques to pick 20 librarians from each public libraries in south east states of Imo, Abia, Enugu, Ebonyi and Anambra state, totaling 100. The instruments used for data collection was questionnaire and checklist. The instrument was subjected to validation by three experts. The reliability of the instrument was ascertained using Cronbach Alpha which obtained a reliability value of 0.82. The researcher distributed the copies of the questionnaire to the respondents through direct method and online Google form. Data were analyzed using mean rating. The study found that majority of web technology tools such as public access catalogs (OPAC), Digital repositories, online databases, and Web 2.0 tools like social media (Facebook, WhatsApp) are available for librarians in public libraries. The extent of utilization of web technology tools by librarians for service delivery in public libraries is high. The challenges such as insufficient funding, inadequate technical support, and cybersecurity concerns critically hinder the effective utilization of web tools for service delivery. Developing clear ICT policies, promoting digital literacy programs, and providing incentives are the key strategies to enhance the availability and utilization of web technology tools in public libraries. In conclusion, the study reveals that availability and utilization of critical digital tools like public access catalogs (OPAC), digital repositories, online databases, and social media platforms such as Facebook and WhatsApp are very critical. The study recommended that explicit ICT policies should be formulated and shared with all stakeholders to encourage sustained engagement and mastery of web technologies

Keyword: Availability, Utilization, Web Technology Tools, Public Libraries, Librarian, Library Service Delivery

Introduction

Libraries function as specialized hubs providing vast arrays of books, journals, multimedia, digital collections, and targeted databases crucial for education and research across fields (Edutinker, 2023). They act as vital spaces enabling users to

retrieve, safeguard, and share knowledge. Incorporating tech resources and digital applications like online scholarly databases and reference tools, libraries bridge conventional and modern scholarly requirements in evolving educational settings (Hussain, 2018). Public libraries are overseen by librarians.

Librarians are skilled experts tasked with overseeing library collections, encompassing cataloging, procurement, arrangement, and enabling access to print and electronic materials (Agim, Ninyio, Abubakar & Rabi'u, 2021). They oversee stock maintenance, user material access, interlibrary exchanges, and routine operations. Their duties blend practical management with instructional support, aligning resources to user demands while embracing tech progress (Ezejiofor, Agim & Ndanwu, 2022). Librarians leverage tools like web technology in service provision to uphold library viability and impact.

Web technology involves coding languages, platforms, structures, and systems for developing and sustaining websites and online apps that support interaction, content sharing, and digital services (Deltait.co.in, 2025). These drive online platform performance, engagement, and linkage, influencing experiences in sectors like commerce, learning, and info distribution. Examples include content systems, browsers, cloud services, and web apps, granting constant, location-independent digital access, compelling librarians to apply them in evolving conventional services into vibrant web-supported offerings.

Availability and Utilization within library and information science means purposefully applying accessible assets to fulfill defined goals (Ezejiofor, et al, 2022). Extending past simple availability, it entails integrating resources into operations and choices. In libraries, it covers librarians' and users' deployment of web and digital assets to advance services, inquiry, and education results. Utilization effectiveness hinges on service priorities, patron expectations, and ICT setups, underscoring its role in harnessing web technology benefits in current libraries (Akwang, 2021).

Librarians' use of available web technology tools denotes incorporating online platforms and apps into public library services to boost reach, interaction, and productivity. Web 2.0 features like Facebook, WhatsApp, YouTube, Wikis, and blogs allow interactive, patron-oriented services such as training, copying, media provision, and instant contact (Okorafor & Ohaegbu, 2019). In Nigerian public libraries, they expand outreach, refine feedback, and promote lively librarian-patron exchanges (Olajide & Agbeko, 2020). This bolsters scholarly networks via prompt, user-friendly info access, elevating service delivery and quality.

Service delivery denotes mechanisms availing services to patrons, spanning engagement, provision, and support ensuring need fulfillment (Agim, Mohammed & Obande, 2024). In libraries, it covers info resource access, aid, guidance, and oversight. Encompassing material supply and relational elements like promptness and

involvement, optimal delivery gauges by speed, standard, contentment, and tech adaptation (Hussain, 2018). Public library services blend core functions like circulation, queries, and indexing with web-enabled ones including virtual access, online aid, e-delivery, and literacy via platforms (Okorafor & Ohaegbu, 2019).

Despite web technology progress and prospects, Nigerian public library librarians encounter hurdles in optimal use. These span ICT shortages, connectivity/maintenance expenses, training deficits, change aversion, and low advanced tool familiarity (Aghauche, 2018). Further, unstable internet, weak backing, and online sharing risks curb adoption (Agim, et al, 2021). Such limits diminish web tech gains in services, lowering satisfaction and library influence. Persistent underuse in public libraries signals need for targeted assessment of availability/utilization for service enhancement in Nigeria. Therefore, this study will examine availability and utilization of web technology tools for services delivery in public libraries in Nigeria

Statement of the Problem

Ideally, public library librarians should maximally employ web technology tools to advance services, ease resource access, strengthen contact, and meet research/learning demands. Yet, realities in numerous Nigerian public libraries show utilization shortfalls. Librarians grapple with facility gaps, ICT skill lacks, training scarcity, and absent support impeding tech embrace and continuity. This yields suboptimal services via restricted digital access, weak engagement, and poor adaptation to user shifts. These issues broadly impact library efficacy/relevance and user outcomes reliant on swift info. Prior research gaps encompass underexplored web tech barriers in public libraries and absent holistic solutions, necessitating this study on availability and utilization of web technology tools for services delivery in public libraries in Nigeria

Purpose of the Study

The study aims to determine availability and utilization of web technology tools for services delivery in public libraries in Nigeria. Specifically:

1. Identify web technology tools available in public libraries.
2. Examine utilization extent of web technology tools by librarians for service delivery in public libraries.
3. Determine challenges hindering librarians from effectively utilizing web technology tools for service delivery in public libraries.
4. Explore strategies enhancing web technology tools availability and utilization by librarians for effective service delivery in public libraries.

Research Questions

1. What web technology tools are available in public libraries?
2. What is the extent of utilization of web technology tools by librarians for service delivery in public libraries?

3. What challenges hinder librarians from effectively utilizing web technology tools for service delivery in public libraries?
4. What strategies will enhance availability and utilization of web technology tools by librarians for effective service delivery in public libraries

Literature Review

Availability

Availability is broadly understood as the assurance that systems, resources, or services are accessible and operational without interruption, ensuring continuous functionality and performance. According to Afolabi (2020), availability refers to the state where systems or services remain accessible and functional, preventing downtime that could disrupt user access. Similarly, Igwe and Ogbona (2019) defines availability as a core component of the CIA (Confidentiality, Integrity, Availability) triad in information security, emphasizing that authorized users must have reliable and timely access to systems and data whenever needed.

Adebayo (2021) expands on availability by describing it as the assurance that an enterprise's IT infrastructure possesses suitable recoverability and protection from failures, disasters, or malicious attacks. This definition underscores the infrastructural and resilience aspects of availability, focusing on the capacity of systems to recover quickly and maintain service continuity. Aptien (2025) further elaborates that availability is one of the essential data quality attributes, meaning that authorized users can obtain data at any time without obstruction. The concept includes preventing both permanent and temporary unavailability, which could result from lost data carriers or system failures, respectively. Maintaining availability thus involves strategies like data backup, disaster recovery, and continuous system monitoring.

Utilization

Utilization refers to the practical use or application of something to achieve a purpose. Gaur (2015) defines utilization as the act of making practical and effective use of an item, which implies that when something is used to fulfill a need or purpose, it has been utilized. Ifafesobi (2015) supports this view by explaining utilization as the action of making practical use of resources or services, such as a library being used for learning, teaching, and research. Similarly, Dirisu (2018) emphasizes that utilization involves using resources to gain satisfaction from them. Ani and Bassey (2017) further describe utilization as the extent to which library collections are used, noting that libraries serve not only as repositories of knowledge but also as avenues for accessing valuable information essential for academic assistance and guidance.

Utilization also stimulates intellectual growth by instilling confidence and encouraging users to develop their talents and capabilities both socially and academically (Abdulsalami & Dika, 2019). Chhiato (2018) views utilization as the ability to access and use resources freely, without hindrance, while Oyewusi and Oyeboade (2018) analyze utilization as the interaction between users and library collections, focusing on maximizing satisfaction and achieving objectives. In the context of web technology

tools, utilization entails applying computers, networks, and telecommunications systems to access electronic information stored in databases. Such usage has significantly transformed the traditional physical consultation process in libraries, allowing users, including librarians and undergraduates, to access information remotely and more efficiently through web platforms, thereby enhancing the speed and ease of information retrieval.

Web Technology Tools

Web Technology Tools encompass a diverse array of instruments and frameworks that facilitate communication, creation, and interaction over the internet. According to Cabello et al. (2024), web technology includes the tools, protocols, and standards required for building, managing, and operating websites and web applications. They emphasize that these tools are foundational for enabling collaborative activities on the Web, such as content creation and sharing, which have become integral to contemporary digital engagement. Likewise, Patel et al. (2023) define web technology as the collection of markup languages, programming languages, and multimedia applications that enable computers to communicate through the internet effectively. This view highlights the technological infrastructure behind web functionalities, including programming languages like HTML, CSS, XML, and server technologies that underpin data transmission and web content delivery.

Further, as described by Yadav et al. (2021), web technology tools incorporate a combination of software frameworks, platforms, and server architectures that allow disparate computer systems to communicate and share resources. These tools include web browsers, web servers, databases, and various business applications customized for specific network tasks. The authors note that these technologies form the infrastructural building blocks for networks of all scales—from local networks to the wide-reaching internet and are essential for effective information exchange and service delivery in digital environments. Similarly, Gupta and Rao (2022) underscore that web technology tools comprise not only the languages and protocols but also the crucial interactive elements like web browsers and domain name systems (DNS) that facilitate website addressing, accessibility, and user navigation.

Librarians

Librarians are professionals trained in the management, organization, and dissemination of information and resources. They play a crucial role in academic institutions by helping users locate and use information effectively. Librarians are responsible for cataloging and maintaining library collections, assisting users with research inquiries, and providing instructional support for information literacy (Kamba & Musa, 2019). In library settings, librarians also engage in activities such as collection development, reference services, and the integration of digital resources into the curriculum. Additionally, librarians conduct workshops and training sessions to enhance information literacy among students and faculty (Omekwu & Ukaegbu, 2021). Their expertise ensures that users in polytechnic libraries, most especially can access and utilize information efficiently, thereby supporting the educational objectives of their institutions.

Librarians are professionals trained in managing, organizing, and facilitating access to information resources. They play a critical role in various settings, including academic, public, and special libraries, by assisting users in locating and utilizing information effectively (Ezeani, 2022; Abdullahi, Funom, Lazarus & Iliasu, 2023). The role of librarians extends beyond traditional book lending to include tasks such as information literacy instruction, resource management, and the implementation of digital technologies. Librarians can be defined as information professionals who manage, organize, and facilitate access to a wide range of information resources. Their role involves assisting users in navigating both traditional and digital information systems, supporting educational and research activities, and adapting to technological advancements. Librarians are essential for ensuring that users can effectively access and utilize information to meet their various needs.

Service Delivery

Service delivery ordinarily encompasses the need to deliver goods or services in a most appreciable format that provides optimum satisfaction to a person or customer. Onah (2023) defines the term “service delivery” as ethical commitment to do the best you can to help anyone who needs your expertise among other things towards creating satisfaction. Service delivery is a state of being able to provide goods or services that satisfies the needs of a client or consumer. Service delivery occurs when there is increased output and efficiency of an employee in a given task (Kouvas, 2016). Service delivery is a psychological state which requires an individual to donate his commitment to the success of the organization. Service delivery enables employees to increase their contribution of work in the business (Koontz & Mills, 2018). Service delivery connotes a level of performance with an increased output that is correlated with the values and abilities of a person to be effective in providing services (Greenhaus, Callanan & Godshalk, 2018). Therefore, service delivery must correspond with the organizational requirements and aims (Cascio, 2018).

Service delivery is a state of being able to provide goods or services that satisfies the needs of a client or consumer. According to Arthur and Rousseau (2016), service delivery can be measured through employee job satisfaction which connotes the level at which an employee is contented with the task or a given job. According to Elejene, Agim and Umunnakwe (2025), service delivery can be measured through employee job satisfaction which connotes the level at which an employee is contented with the task or a given job; employees commitment which connotes the level at which the employee involves himself or herself towards the success of the goals of the organization; employee efficiency which connotes the extent at which an employee gets his task or job done as well as the speed at which the task is performed; employee job security which connotes the level at which an employee’s job is secured without the fear of being sacked at any slightest job error and employee participation which connotes the level at which employees are allowed to partake in decisions that affects them and the organization (Arthur & Rousseau, 2016). All these variables serve as a motivating factor to enhance service delivery in a work place.

Web Technology Tools Availability in Public Libraries

Web technology tools form a core component in contemporary public libraries, evolving conventional services into interactive, patron-focused, and reachable systems. These encompass software, online platforms, and web resources aiding functions like cataloging, info retrieval, user engagement, content oversight, and research aid. Chigona et al. (2023) identify web technology tools in public libraries as including Integrated Library Systems (ILS), discovery platforms like Primo and EBSCOhost, and communication channels such as LibGuides and social media, boosting resource access and involvement. They enable smooth merging of print and digital holdings, offering unified search interfaces for varied collections. Web 2.0 adoption further nurtures collaboration, promoting knowledge exchange and participatory learning among patrons and librarians (Wang, 2020).

Public libraries increasingly transition from standard Online Public Access Catalogs (OPACs) to comprehensive web-scale discovery systems consolidating databases into one search point (Funom, Lazarus & Abdullahi, 2023). Hamlett and Georgas (2019) stress these tools transform info access via concurrent print/electronic searches, easing patron workflows. Web tools also feature repository systems like DSpace and Fedora for preserving and openly sharing outputs, enhancing visibility and dissemination. Tools such as chatbots, virtual references, and learning integrations now standardize reference and instructional aid (Boateng & Liu, 2014). These position web technology as vital for addressing public library patrons' changing demands.

Okafor and Nwosu (2022) observe Nigerian public libraries expanding digital offerings like OPAC and e-databases for research aid. Obi and Ezeani (2023) note Web 2.0 like social media improves librarian-patron communication and teamwork in Nigerian public libraries. Chukwuma and Anazodo (2024) highlight digital repositories' role in output preservation/sharing, available in public settings like Imo State for superior service. Web technology tools convert public libraries into efficient, welcoming knowledge centers. They aid resource discovery, communication, collaboration, and engagement. Research shows many public libraries integrate various web tech, yet infrastructure/training issues persist. Supportive policies and development position public libraries to harness these for modern service needs. Web tool progress marks key library innovation and excellence.

Librarians' Utilization Extent of Web Tools for Public Library Services

Web technology tools crucially boost librarians' service delivery in public libraries. Studies cite tools from web catalogs and repositories to social media and online collaboration. Emmanuel et al. (2024) report public librarians using Web 2.0 for resource access, engagement, and prompt services via online catalogs, management systems, and digital references. Utilization ties to staff ICT skills, support, and tool

relevance (Boateng & Liu, 2020). Librarians embrace web tools amid demands for remote/real-time access, hastened by pandemics (Idahosa, 2023). Chat references, virtual environments, and mobile databases meet needs beyond physical spaces. Challenges like training shortages and infrastructure limit potential. Oladipo et al. (2021) note ICT literacy gaps constrain digital platform use, affecting quality/satisfaction.

Emmanuel et al. (2024) found strong OPAC/digital tool adoption among public librarians, aiding research/user satisfaction. Agbo and Odume (2023) highlight social media/virtual references for engagement, with mobile limits. Oladipo and Adebayo (2022) and Uzoagba, Agim and Ezejiofor (2024) urged training/infrastructure for webinars/literacy growth. Public library librarians' web tool utilization markedly improves services via access, interaction, and support. Adoption merits praise, but development/upgrades address barriers for full potential. Digital evolution demands research/investment for sustained quality services.

Challenges Limiting Effective Web Tool Utilization in Public Libraries

Web technology tools vitalize public library services with benefits enhancing efficiency, reach, and interaction. Web platforms grant instant/24/7 digital access, easing traditional limits. Emmanuel et al. (2024) note staff using online catalogs/repositories/portals boost remote access, aiding productivity/performance. Tools enable patron models with virtual aid, e-modules, and online materials for convenience (Boateng & Liu, 2020). Web tools advance librarian-patron communication/collaboration. Social media, forums, emails enable real-time feedback/info sharing, lifting responsiveness. Agbo and Odume (2023) stress dynamic interaction for knowledge ties. Cloud/sharing portals aid collaborative discussions beyond sites. Analytics/feedback yield user insights for improvements (Yaro & Omotayo, 2023).

Challenges like funding shortages, tech support lacks, power instability, cybersecurity impede web use. Okoro and Ojo (2023) cite ICT/training deficits as digital service barriers. Ezeani and Ugwuanyi (2022) note power/support issues harm web sustainability. Nwosu and Onuoha (2024) highlight skill/policy gaps mirroring user literacy. Okwu and Agu (2023) call for infrastructure/capacity/policy investments for Nigerian public library integration. Public library web benefits span access, communication, efficiency, development, growth. They foster user-friendly, innovative environments. Success needs training/investments/planning against resistance/constraints. Tech evolution makes web embrace essential for knowledge/learning hubs.

Optimal web tool use by public library librarians requires strategies spanning tech, human, organizational factors. Key is sustained ICT/emerging tech training. Boateng and Liu (2020) argue programs build competencies/attitudes for adoption.

Workshops/webinars/certifications update on discovery/repositories/virtual services for satisfaction. Institutionalized policy-linked capacity sustains impact. Infrastructure/investment ranks vital. Funding for connectivity/hardware/software ensures reliability. Agbo and Odume (2023) state modern IT aids seamless web integration. Cloud/mobile portals promote inclusion for remote users. Website/catalog upgrades boost usability/adoption, motivating librarians (Emmanuel et al., 2024).

Clear ICT policies, literacy programs, incentives enhance utilization. Ani and Akinyemi (2023) stress training/infrastructure for Nigerian public digital services. Odufuwa and Suleiman (2024) identify policies/incentives for adoption. Adewole and Eze (2022) highlight literacy/collaboration for IT integration. User education/awareness maximizes web gains. Training on resources/databases/virtual services accelerates adoption (Chigona et al., 2023). Webinars/tutorials/guides raise literacy for navigation. Patron training complements staff development for full web realization in productivity.

Methodology

The descriptive survey research design was used for this study. The population of this study comprised of 3160 public librarians in the 316 public libraries nationwide, comprising 37 state libraries (one per state), 253 branches, and 25 national library branches. The research used the purposive sample techniques to pick 20 librarians from each public libraries in south east states of Imo, Abia, Enugu, Ebonyi and Anambra state, totaling 100. The instruments used for data collection was questionnaire and checklist. The instrument was subjected to validation by three experts. The reliability of the instrument was ascertained using Cronbach Alpha which obtained a reliability value of 0.82. The researcher distributed the copies of the questionnaire to the respondents through direct method and online google form using one week to complete the process. Data were analyzed using mean rating.

Analysis of Data

Cluster 1: What web technology tools are available in public libraries?

Table 1: Observation checklist on web technology tools available in public libraries

S/N	Items	Available	Not Available
1	The library provides access to online public access catalogs (OPAC).	√	
2	Digital repositories are available for accessing theses and dissertations.	√	
3	The library has online databases subscribed for research purposes.	√	
4	Web 2.0 tools like social media (Facebook, WhatsApp) are available for librarians.	√	
5	Institutional websites are available for librarians.	√	

6	E-journal access through web portals are available for librarians.	√	
7	Virtual reference services (live chat, email) are available online.		x
8	Online seminar and webinar platforms are available for librarians.	√	
9	Mobile-accessible library services are available for librarians.		x
10	Blogs and newsletters online are available for librarians	√	

The data presented in Table 1 showed that online public access catalogs (OPAC), Digital repositories, online databases, Web 2.0 tools like social media (Facebook, WhatsApp), E-journal access through web portals, Online seminar and webinar platforms, Blogs and newsletters online, and Institutional websites are available for librarians in Public libraries. However, Virtual reference services (live chat, email) and Mobile-accessible library services are not available for librarians Public libraries. This implies that majority of web technology tools such as public access catalogs (OPAC), Digital repositories, online databases, and Web 2.0 tools like social media (Facebook, WhatsApp) are available for librarians in Public libraries

Cluster 2: What is the extent of utilization of web technology tools by librarians for service delivery in public libraries?

Table 2: Mean Responses on the extent of utilization of web technology tools by librarians for service delivery in Public libraries

S/N	Items	Mean	Decision
1	Librarians frequently use OPAC to assist users in resource discovery.	3.20	Very High Extent
2	Digital repositories are regularly used for document delivery.	2.80	High Extent
3	Online databases are used extensively for academic research support.	2.90	High Extent
4	Web 2.0 tools are often employed to communicate and engage users.	2.70	High Extent
5	Virtual reference services are regularly utilized.	3.10	Very High Extent
6	Social media platforms are actively used to promote library services.	3.25	Very High Extent
7	Webinars and online training are used for user education.	2.40	Low Extent

8	Mobile library services are used to ensure accessibility.	2.45	Low Extent
9	Library websites are continuously used and updated by librarians.	2.20	Low Extent
10	Librarians regularly use analytics from web tools to improve services	3.35	Very High Extent
	Grand Mean (*x*)	**2.84**	**High Extent**

The data presented in Table 2 showed that the respondents agreed that items related to the use of OPAC, virtual reference services, social media platforms, and analytics in web tools are perceived at a very high extent of utilization by librarians. Items categorized as high extent encompass digital repositories, online databases, Web 2.0 communication tools, and webinars and online training. Conversely, the low extent category includes mobile library services, and website updating is to a low extent. The grand mean of 2.84 implies that the extent of utilization of web technology tools by librarians for service delivery in Public libraries is high

Cluster 3: What challenges hinder librarians from effectively utilizing web technology tools for service delivery in public libraries?

Table 3: Mean Responses on the challenges hinder librarians from effectively utilizing web technology tools for service delivery in public libraries

S/N	Items	Mean	Decision
1	There is inadequate training on the use of advanced web technology tools.	3.20	Strongly Agree
2	Limited internet bandwidth affects the accessibility of web services.	2.80	Agree
3	Insufficient funding restricts procurement of necessary technology resources.	3.15	Strongly Agree
4	Resistance to change among library staff hinders adoption of tools.	2.95	Agree
5	Lack of institutional policies on ICT integration impedes progress.	2.90	Agree
6	Technical support for web platforms is often inadequate.	3.12	Strongly Agree
7	Power supply instability disrupts continuous service delivery.	3.05	Strongly Agree
8	Some librarians lack sufficient ICT skills to fully use web tools.	2.75	Agree
9	Users' lack of digital literacy limits web-based resource utilization.	2.88	Agree
10	Cybersecurity concerns limit full exploitation of online services.	3.08	Strongly Agree
	Grand Mean **(*x*)**	**2.99**	**Agree**

The table indicates that librarians strongly agree that challenges such as inadequate training on advanced web technologies, insufficient funding, inadequate technical support, unstable power supply, and cybersecurity concerns critically hinder the

effective utilization of web tools for service delivery. These challenges represent significant infrastructural and capacity-related barriers. Meanwhile, challenges like limited internet bandwidth, resistance to change, lack of institutional ICT policies, inadequate ICT skills among librarians, and users' limited digital literacy are also recognized as substantial but fall under "Agree." The consensus underscores that both resource availability and human factors contribute to the limited adoption and effectiveness of web technologies. The grand mean of 2.99 reflects an overall strong perception that challenges such as insufficient funding, inadequate technical support, unstable power supply, and cybersecurity concerns critically hinder the effective utilization of web tools for service delivery

Cluster 4: What strategies will enhance availability and utilization of web technology tools by librarians for effective service delivery in public libraries**?**

Table 4: Mean Responses on the strategies will enhance availability and utilization of web technology tools by librarians for effective service delivery in public libraries

S/N	Items	Mean	Decision
1	Constant capacity building on ICT for librarians should be instituted.	2.85	Agree
2	Infrastructure upgrades including high-speed internet must be prioritized.	3.10	Strongly Agree
3	Adequate budget allocations for technology acquisition are necessary.	2.90	Agree
4	Developing clear ICT policies to guide technology adoption is essential.	3.01	Strongly Agree
5	Encouraging staff participation in decision-making fosters ownership.	2.77	Agree
6	Strengthening technical support services ensures sustainability.	2.89	Agree
7	Promoting digital literacy programs for library users enhances usage.	3.15	Strongly Agree
8	Providing incentives motivates technology adoption.	3.20	Strongly Agree
9	Collaboration with other institutions facilitates knowledge sharing.	2.86	Agree
10	Regular feedback loops help refine technology use.	2.80	Agree
	Grand Mean **(*x*)**	**2.98**	**Agree**

This table clearly highlights that librarians strongly agree on the necessity of prioritizing infrastructure upgrades, developing clear ICT policies, promoting digital literacy programs, and providing incentives as key strategies to enhance the availability and utilization of web technology tools. These strategies are viewed as critical for driving adoption and enhancing the effectiveness of service delivery in the library

environment. Meanwhile, other factors such as constant capacity building on ICT, adequate budget allocation, fostering staff participation, strengthening technical support, collaboration, and regular feedback loops also received strong agreement, signifying their importance in supporting sustainable web technology use. Overall, the grand mean of 2.98 underscores a generally positive consensus among librarians that developing clear ICT policies, promoting digital literacy programs, and providing incentives are the key strategies to enhance the availability and utilization of web technology tools in Public libraries.

Discussion of Findings

The discussion was done under the following sub-headings:

Research question 1 sought to determine the web technology tools available in Public libraries. Data from the study shows that majority of web technology tools such as public access catalogs (OPAC), Digital repositories, online databases, and Web 2.0 tools like social media (Facebook, WhatsApp) are available for librarians in Public libraries. This result aligns with empirical evidence from various recent studies. For example, Okafor and Nwosu (2022) found that Nigerian Public libraries increasingly provide digital resources including OPAC and electronic databases to enhance research support. Similarly, Obi and Ezeani (2023) highlight the adoption of Web 2.0 technologies such as social media to improve communication and collaboration among librarians and users in Nigerian Public libraries. Furthermore, Chukwuma and Anazodo (2024) reveal that digital repositories are pivotal in preserving and sharing scholarly output, with availability towards fostering effective service delivery.

Research question 2 sought to determine the extent of utilization of web technology tools by librarians for service delivery. The data shows that majority of web technology tools such as public access catalogs (OPAC), Digital repositories, online databases, and Web 2.0 tools like social media (Facebook, WhatsApp) are used by librarians in Public libraries. Similar studies reinforce these findings. Emmanuel et al. (2024) observed high adoption rates of OPAC and digital tools among public librarians, emphasizing their efficacy in improving research support and user satisfaction. Agbo and Odume (2023) noted that social media and virtual reference services have become indispensable for library-user engagement, though limitations exist in mobile service use. Oladipo and Adebayo (2022) stressed the critical role of ongoing training and infrastructure development to support the growth of webinars and digital literacy initiatives.

Research question 3 sought to determine the challenges that hinder librarians from effectively utilizing web technology tools for effective service delivery**.** The challenges such as insufficient funding, inadequate technical support, unstable power supply, and cybersecurity concerns critically hinder the effective utilization of web tools for service delivery. These findings resonate with empirical research in Nigerian Public libraries. Okoro and Ojo (2023) highlighted inadequate ICT infrastructure and insufficient

training as major impediments to digital library services. Similarly, Ezeani and Ugwuanyi (2022) found power instability and poor technical support severely affected the sustainability of web-based resources in Public libraries. Moreover, Nwosu and Onuoha (2024) emphasized that librarians' ICT skill gaps and institutional policy deficits substantially limit the effective deployment of digital tools, paralleling user digital literacy challenges. Studies by Okwu and Agu (2023) amplify the call for strategic investment in infrastructure, capacity building, and policy formulation to foster better web technology integration in Nigerian Public libraries.

Research question 1 sought to determine the **s**trategies that enhance the availability and utilization of web technology tools by librarians for effective service delivery**.** Data from the study revealed that developing clear ICT policies, promoting digital literacy programs, and providing incentives are the key strategies to enhance the utilization of web technology tools in Public libraries. Empirical studies corroborate these findings. Ani and Akinyemi (2023) emphasize the role of continuous ICT training and robust infrastructure in enhancing digital library services in Nigerian Public libraries. Similarly, Odufuwa and Suleiman (2024) identify clear ICT policies and incentivization as vital for sustaining web technology adoption among librarians. Adewole and Eze (2022) further highlight the importance of digital literacy promotion and stakeholder collaboration as pivotal to the successful integration of information technology in Public libraries.

Conclusion

In conclusion, the investigation into the availability and utilization of web technology tools for service delivery in Nigerian public libraries demonstrates substantial presence and application of key digital resources, including public access catalogs (OPAC), digital repositories, online databases, and social media platforms like Facebook and WhatsApp. Librarians exhibit favorable views on the advantages these tools offer for service enhancement. Nevertheless, persistent obstacles such as funding shortages, limited technical assistance, erratic power supply, and cybersecurity risks continue to impede their full potential. Tackling these through defined ICT policies, digital literacy initiatives, and suitable incentives stands as crucial for advancing web technology adoption and elevating public library services across Nigeria. This holistic strategy is imperative for cultivating a robust digital library ecosystem responsive to patrons' changing demands.

Recommendations

Drawing from the study's findings, the following recommendations address the identified issues:

1. To maintain the availability of web technology tools like OPAC, digital repositories, online databases, and social media platforms, public libraries should consistently fund upgrades and upkeep of these vital digital assets, keeping them reliable, up-to-date, and accessible for librarians and users.

2. With the notable utilization levels of web technology tools by librarians, ongoing training and skill-building programs should be established to reinforce and expand librarians' expertise, enabling optimal technology deployment for superior service delivery.
3. To counter funding inadequacies, library administrators should partner with government bodies and external collaborators to obtain sufficient resources for acquiring necessary infrastructure to support library operations.
4. To boost utilization, explicit ICT policies should be formulated and shared with all stakeholders to encourage sustained engagement and mastery of web technologies.

References

Abdulsalami, L.T & Dika, S.I, (2019) Utilization of social media services for current awareness provision to registered users of federal university library, Lafia. *Library Philosophy and Practice (e-journal). 2531*. https://digitalcommons.unl.edu/libphilprac/2531

Abdullahi, N. O., Funom, B. C., Lazarus, G. N., & Iliasu, J. (2023). Automated library service: An assessment of Baze University Library Abuja. Lafia Journal of Library and Information Science, 4(2), 1-13.

Adebayo, F. (2021). Service improvement in academic libraries: A case for enhancement through technology. Nigerian Journal of Library and Information Science, 19(3), 45-58

Adewole, T. O., & Eze, P. A. (2022). Digital literacy and information technology adoption in Nigerian academic libraries. Journal of Library and Information Services, 29(2), 158-172.

Afolabi, A. (2020). Resource availability in academic libraries: A study of Nigerian university libraries**.** Nigerian Library and Information Science Review, 24(2), 103-119.

Agbo, K. A., & Odume, O. (2023). Accessibility and utilization of internet services in Nigerian university libraries. International Journal of Library and Information Science, 15(3), 87–102.

Aghauche, E. E. (2018). Perceived challenges of using web-based library services in Nigerian university libraries. Journal of Library and Information Science, 34(2), 45–55.

Agim, E.C., Ninyio, H.T., Abubakar T,A. & Rabi'u, A (2021) Optimization of e-platforms for teaching and learning in the era of Covid 19 lockdown: A case for librarians in Africa. *International Journal of Studies in Education, 17* (1), 144-152

Agim, EC, Mohammed, LG, & Obande, B.O (2024) Library innovation and use of makerspaces for service delivery in public libraries: A case of Enugu state library board. Review of Information Science and Technology (RIST), 10, p.73-83

Akwang, N. E. (2021). A study of librarians' perceptions and adoption of web 2.0 technologies in academic libraries. Journal of Library Administration, 61(5), 520-539.

Aptien. (2025, January 12). What is availability. Cybersecurity glossary. https://aptien.com/en/kb/articles/what-is-availability

Arthur, M. B., & Rousseau, D. M. (2016). Introduction: The boundaryless career as a new employment principle. In M. B. Arthur & D. M. Rousseau (Eds.), *The boundaryless career: A new employment principle for a new organizational era* (pp. 3–20). New York: Oxford University Press.

Boateng, R., & Liu, S. (2014). Web 2.0 technologies and academic libraries: An exploration of academic librarians' perceptions and adoption. The Electronic Library, 32(3), 419–438. https://doi.org/10.1108/EL-10-2012-0135

Boateng, R., & Liu, S. (2020). Factors influencing the incorporation of web technologies by university libraries in the Southern African Development Community (SADC) region. The Journal of Academic Librarianship, 46(4), 102–111.

Cabello, R., Gonzalez, I., & Gomez-Arribas, F. (2024). Web technology: Tools, protocols, and standards for web applications. Journal of Internet Technologies, 25(1), 15-27.

Cascio L.O, (2018). *Principles and Practice of Personnel Management*, Jennifer Pegg. Cambridge. Madrid

Chhiato L (2018) *Use of social networks for dissemination of information by media professionals in Mizoram*. A dissertation submitted in partial fulfilment of the requirement the Degree of Master of Philosophy in Library and Information Science, Department of Library and Information Science (School of Economics, Management and Information Science) Mizoram University

Chigona, A., Ndlovu, B., & Dzvimbo, G. (2023). Use of emerging technologies in university libraries: Enhancing information access and collaboration. Journal of Information Science, 49(1), 79–94.

Chukwuma, E., & Anazodo, U. (2024). The role of digital repositories in academic scholarship: Evidence from Nigerian universities. Journal of Information Science and Technology, 40(1), 45-58.

Deltait.co.in. (2025). What is Web Technology? Complete Guide. https://www.deltait.co.in/blog/what-is-web-technology-complete-guide/

Dirisu, B. M. (2018). Availability and Utilization of Information and Communication Technologies (ICTs) in Colleges of Education (COE) Minna: A Survey. *International Journal of Information and Communication Technology, 6* (2) 149-153

Edutinker. (2023). What is a University Library? https://edutinker.com/glossary/university-library/

Elejene, A.O., Agim, E.C.; & Umunnakwe, E.C (2025) Utilization of Robotics in Enhancing Service Delivery to Users in Academic Libraries in Nigeria. International Journal of Information Resource Management (IJIRM), 2, 2; 1-17. https://www.ijirm.com.ng/admin/img/paper/29.Agim.pdf

Emmanuel, N., Salau, S., & Adebayo, T. (2024). Influence of staff ICT skills on adoption and use of Web 2.0 technologies in university libraries in South-South, Nigeria. International Journal of Academic Research, 10(2), 149–160.

Ezeani, A. (2020). User-centered library services. Journal of Academic Services, 14(4), 99-113.

Ezeani, C. N., & Ugwuanyi, C. S. (2022). The impact of infrastructural challenges on academic libraries' virtual services in Nigerian universities. Library Philosophy and Practice, 2022(1), 1-17. https://digitalcommons.unl.edu/libphilprac/6205

Ezejiofor, V.N., Agim, E.C. & Ndanwu, A.I. (2022) Availability and Utilization of Information Resources for Igbo Studies in Chukwuemeka Odumegwu Ojukwu University Library, Igbariam Campus. Library Research Journal, 7. p1-7. https://journals.unizik.edu.ng

Funom, B. C., Lazarus, G. N., & Abdullahi, N. O. (2023a). Automated library services: An assessment of Baze University Library Abuja. Lafia Journal of Library and Information Science, 4(2), 1-13. http://lalibjournals.org/index.php/LJLIS/article/view/120

Gaur, S. (2015). *Information source and services*. New Delhi: Excel books private limited

Greenhaus, J. H., Callanan, G. A., & Godshalk, V. M. (2018). *Career management*. Orlando, FL: Harcourt, Inc

Gupta, S., & Rao, M. (2022). Understanding web technologies: The core tools behind the internet. International Journal of Computer Science, 34(2), 120-135.

Hamlett, P., & Georgas, H. (2019). Web-scale discovery tools: Transforming library services. Library Hi Tech, 37(2), 230–242. https://doi.org/10.1108/LHT-09-2018-0118

Hussain, A. H. (2018). Awareness of Web 2.0 technology in the academic libraries of Islamabad, Pakistan. Library Philosophy and Practice. https://digitalcommons.unl.edu/libphilprac/1945/

Idahosa, M. (2023). Librarians' awareness and attitude towards deployment of cloud computing technologies in university libraries. International Journal of Librarianship, 8(1), 23–37.

Ifafesobi, S.O. (2015). Readers services in Akinforlarin, W.A (ed.) *Effectiveness of Library*. Akure: AOGE Nig. Ltd

Igwe, D., & Ogbona, P. (2019). Resource availability and academic success: The impact on Nigerian students. African Journal of Information Management, 13(4), 45-58

Kamba, M., & Musa, M.A. (2019). Influence of reference librarians on user satisfaction in Nigerian libraries. *Library Review Journal*, 28(2), 55-67.

Koontz, A. and Mills, C (2018) *Management*. Japan, McGraw-Hill International Book Company

Kouvas, A. (2016). Corporate governance: A paradigmatic look. *International Journal of Social Economics, 34*(8), 506-524.

Nwosu, I. E., & Onuoha, B. C. (2024). ICT competence and policy impacts on digital library services in Nigerian universities. Journal of Emerging Trends in Library and Information Science, 15(1), 31-44.

Obi, P., & Ezeani, C. (2023). Use of Web 2.0 technologies in Nigerian academic libraries: Trends and challenges. Library Management, 44(3), 273-288.

Odufuwa, L. A., & Suleiman, M. T. (2024). The role of ICT policies and incentives in enhancing digital library services: Perspectives from Nigerian librarians. Information Development, 40(1), 45-59.

Okafor, N., & Nwosu, C. (2022). Availability and utilization of electronic information resources in Nigerian university libraries. Library Philosophy and Practice, 2022, Article 7891.

Okorafor, K. A., & Ohaegbu, G. A. (2019). Utilisation of Web 2.0 tools for effective library services by librarians in university libraries in Southwest Nigeria. European Scientific Journal, 15(31), 150-162.

Okoro, N. S., & Ojo, T. O. (2023). Barriers to the effective use of web-based library services in Nigerian academic libraries. Library Management, 44(3), 222-235.

Okwu, A., & Agu, O. (2023). User digital literacy and academic library service delivery in Nigeria: Challenges and prospects. Information Development, 39(4), 512-523.

Oladipo, S., & Adebayo, T. (2022). Cost-effective management of academic resources using web-based tools. Library Management, 43(4), 213–228. https://doi.org/10.1108/LM-09-2021-0074

Oladipo, S., Afonja, S., & Adeyemi, K. (2021). Multimedia resources and user engagement in academic libraries in Nigeria. Library Management, 42(3), 167–179. https://doi.org/10.1108/LM-12-2020-0203

Olajide, O. S., & Agbeko, N. A. (2020). Web 2.0 tools and academic library services. International Journal of Library and Information Science, 12(2), 22-29.

Omekwu, C., & Ukaegbu, J.C. (2021). The role of reference librarians in academic institutions. *Journal of Library Services*, 33(3), 34-47

Onah, F. O. (2023). *Human resource management.* Enugu: Fulladu publishing company

Oyewusi, S & Oyeboade, E. (2018). Predicting faculty member adoption and utilization of reference tools by diffusion theory approach: case study at the University of Sri. *Jayewardenepura in Sri Lanka, 2* (7) 87-97

Patel, R., Yadav, C. S., & Sharma, L. (2023). Web technology and communication: An integrative review. International Journal of Information Technology, 29(4), 334-349.

Uzoagba, N.C., Agim, E.C., & Ezejiofor, V.O. (2024) Assessment of the Implementation of Information and Communication Technology (ICT) tools among Library Educators in Tertiary Institution in Anambra State. Library Philosophy and Practice (e-journal), 8068. https://digitalcommons.unl.edu/libphilprac/8068

Wang, C. (2020). Adoption and use of web-scale discovery tools in academic libraries. Library Collections, Acquisitions, and Technical Services, 44(1), 1–11.

Yadav, M., Tiwari, S., & Anand, Y. (2021). Web technology frameworks and architectural design. Journal of Modern Computing, 10(4), 280-295.

Yaro, B., & Omotayo, T. (2023). Data-driven decision making in university libraries: Benefits and challenges. Library & Information Science Research, 45, 101007.