USE OF WEB 2.0 APPLICATIONS AMONG LIBRARY STAFF IN FEDERAL UNIVERSITY LIBRARIES IN NORTH-WEST NIGERIA

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Abstract
This study examined the use of Web 2.0 applications for information service delivery in selected federal university libraries in North-West Nigeria. Specifically, the study identified the types of Web 2.0 applications used by library staff and examined the challenges associated with their use for information service delivery. The study adopted a descriptive research design of the cross-sectional survey type. The population comprised 336 professional and paraprofessional library staff, consisting of 188 from Ahmadu Bello University, Zaria; 138 from Bayero University, Kano; and 10 from the Federal University of Birnin Kebbi. Data were collected using a structured questionnaire and analysed using descriptive statistics, including frequencies, percentages, and mean scores. The findings revealed that Facebook, WhatsApp, and YouTube were the most commonly used Web 2.0 applications, while WordPress, Skype, wikis, and library blogs were the least used. The major challenges associated with the use of Web 2.0 applications included low user engagement, inadequate technological infrastructure, and data privacy concerns. Other challenges were digital literacy gaps, rapid technological changes, lack of user awareness, inadequate institutional support, resistance to change, funding constraints, and limited training opportunities. The study concludes that, despite the transformative potential of Web 2.0 applications, their effective use for information service delivery in federal university libraries in North-West Nigeria remains constrained by technological, institutional, and human-capacity challenges. The study recommends increased investment in ICT infrastructure, regular digital literacy and technical training for library staff, improved funding, and strengthened institutional support for the adoption and effective utilization of Web 2.0 applications.

Keywords: Web 2.0 applications, information service delivery, challenges, and federal university libraries.

Introduction

The integration of Information and Communication Technologies (ICTs) has transformed library services globally, shifting from traditional print-based collections to dynamic, technology-driven information environments. Web 2.0 applications, a term popularized by Tim O'Reilly in 2005, Represent the transition from static web environments to interactive and participatory platforms, including social networking sites, blogs, wikis, and other collaborative tools (Agbetuyi & Isah, 2021). Academic libraries have increasingly incorporated these technologies to remain relevant and to meet the changing expectations of their users.

The Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh et al. (2003), provides a useful framework for understanding the adoption and use of emerging technologies such as Web 2.0 applications in library environments. Studies by Ali, Ghulam, Ghouse, and Khaisar (2018), Omorodion, Cyril, and Titilayo (2019), and Khan, Sulaiman, and Akanbi (2020) have applied and validated the UTAUT model in studies relating to Web 2.0 applications and social media use.

Despite their numerous benefits, the use of Web 2.0 applications in developing countries remains inconsistent due to several technological, institutional, and human-capacity challenges. Ranjan and Bhatt (2021) observed that technological infrastructure, digital literacy, and librarian engagement significantly influence the use of Web 2.0 applications. Similarly, Gichora and Kwanya (2019) found that many academic libraries in Kenya had not fully embraced Web 2.0 technologies. A similar situation exists in Nigeria, where the slow adoption of these technologies has been associated with inadequate technological infrastructure, digital literacy gaps, and erratic power supply (Adeyinka & Taofeeqat, 2016; Baro, Idiodi, & Godfrey, 2017). These challenges have continued to hinder librarians' ability to effectively utilise Web 2.0 applications for information service delivery.

Statement of the Problem

In contemporary academic environments, libraries are increasingly expected to integrate Web 2.0 applications to enhance information service delivery, promote digital literacy, and facilitate collaborative knowledge sharing among users (Abbas & Ismail, 2020; Oduwole, 2018). However, evidence from the literature indicates that while libraries in developed countries have effectively adopted and integrated Web 2.0 tools into their service delivery systems (Tripathi & Kumar, 2020), Nigerian academic libraries, particularly those in the North-West geopolitical zone, continue to lag behind in the adoption and effective use of these technologies (Obasola & Mamudu, 2021).

This study was motivated by the concern that, despite the transformative potential of Web 2.0 applications, library staff in many federal university libraries in Nigeria, particularly those in North-West Nigeria, continues to experience persistent challenges in their use for information service delivery. These challenges include inadequate technical competence, limited training opportunities, insufficient technological infrastructure, and inadequate institutional support (Adeyinka & Taofeeqat, 2016; Anunobi & Ogbonna, 2020). Such challenges not only hinder the effective utilization of Web 2.0 applications but may also undermine user engagement and the overall quality of library services.

Therefore, there is a need to investigate the types of Web 2.0 applications used and the challenges associated with their utilization for information service delivery among library staff in selected federal university libraries in North-West Nigeria. This study, therefore, seeks to provide empirical evidence that can guide policy and practice in improving the adoption and effective utilization of Web 2.0 applications in university library services.

Research Objectives

The specific objectives of the study were to:

1. identify the types of Web 2.0 applications used by library staff for information service delivery in the study area; and
2. examine the challenges associated with the use of Web 2.0 applications for information service delivery among library staff in the study area.

Literature Review

Web 2.0 refers to the second generation of web development that facilitates communication, information sharing, collaboration, and user participation through applications such as blogs, wikis, social networking platforms, and other social media tools (Agbetuyi & Isah, 2021). Unlike the static nature of Web 1.0, Web 2.0 applications encourage interaction, participation, collaboration, and the co-creation of content between librarians and users (Olaifa & Oyekanmi, 2021; Anunobi & Nwabueze, 2020).

Although Web 2.0 technologies have been widely adopted in developed countries, their adoption in Nigeria remains constrained by inadequate ICT infrastructure, low awareness, and insufficient technical skills (Lawal & Isah, 2020; Oyewusi et al., 2019). Nigerian librarians appear to be more familiar with social networking platforms, blogs, and messaging applications, with many acquiring relevant competencies through workshops, professional training, and self-directed learning (Adekunmisi & Ilogho, 2023).

Types of Web 2.0 Applications

There are various types of Web 2.0 applications that can be used for information service delivery. These technologies enable librarians to connect and interact with users, including those who may not physically visit the library to access its services (Kumari & Khan, 2016). Some of the major Web 2.0 applications used by academic libraries include:

1. **Websites:** Websites are important tools for disseminating information and providing access to library services. They provide libraries with an online presence and create opportunities to promote library resources, products, and services (Burke, 2011; Tella & Oladapo, 2016).
2. **Blogs:** Blogs are among the widely used Web 2.0 tools. The term *blog* is derived from the expression *web log*. Blogs provide platforms for publishing information, announcements, opinions, and other forms of content, usually arranged in reverse chronological order (Harinarayana & Vasantha Raju, 2010; Baro et al., 2013; Kumari & Khan, 2016; Lihitka & Manohar, 2018).
3. **Wikis:** A wiki is a collaborative website that allows users to create, modify, and edit content collectively. Wikis facilitate collaborative knowledge creation and sharing among users and information professionals (Zanin-Yost, 2010).
4. **Social Bookmarking and Tagging:** Social bookmarking and tagging enable internet users to collect, store, organise, tag, and share online resources. Although the terms are sometimes used interchangeably, they refer to related but distinct mechanisms for organising and sharing digital information (Zadeh, Veisi, & Zadeh, 2013).
5. **Social Networking:** Social networking platforms enable individuals and groups with common interests to communicate, interact, and share information online. They provide opportunities for creating communities, facilitating discussions, and promoting collaboration (Baro et al., 2013; Sekar, Loganathan, & Kasirao, 2018).
6. **Instant Messaging (IM):** Instant messaging is a synchronous form of online communication that facilitates real-time interaction between individuals. It has increasingly been used in libraries to complement or replace traditional email and form-based reference services.
7. **Podcasting and Vodcasting:** Podcasting involves the distribution of audio content through the internet, while vodcasting refers to the distribution of video content. Libraries

can use these tools to market new resources, products, services, orientation programmes, and other library events.

8. **Really Simple Syndication (RSS):** RSS enables users to receive updates and feeds from subscribed websites. Academic libraries can use RSS to disseminate information about library activities, new resources, products, services, and other relevant updates.
9. **Google Forms:** Google Forms can be used to support reference and information services by enabling users to submit their details and information requests electronically. Librarians can then access the requests and provide appropriate responses.
10. **Zoom:** Zoom is an online communication platform that can be used for virtual information literacy programmes, user education, question-and-answer sessions, orientation programmes, and other online library activities.
11. **Internet Telephony:** Internet telephony involves the use of internet connectivity to make and receive voice calls. Libraries can utilize internet-based communication tools to interact with users and provide selected services remotely.
12. **Google Classroom:** Google Classroom can be used by university libraries to disseminate information and learning resources to students. Librarians can create online classes and invite students to participate in information literacy programmes and other activities aimed at promoting library resources and services.

Challenges Associated with the Use of Web 2.0 Applications for Information Service Delivery

The use of Web 2.0 applications in university libraries in developing countries continues to face numerous structural, technical, and human-capacity challenges. One of the most frequently identified barriers is inadequate digital competence among librarians. A study conducted in Pakistan found that insufficient internet skills significantly hindered the effective use of Web 2.0 tools in libraries (Arif & Mahmood, 2019). Similarly, research conducted in Nigeria revealed that accessibility limitations, inadequate technical knowledge, and erratic power supply constrain librarians' ability to adopt and effectively use these technologies (Adeyinka & Taofeeqat, 2016).

Beyond skills-related challenges, institutional and operational constraints also hinder the implementation of Web 2.0 applications. Baro, Idiodi, and Godfrey (2013) identified lack of time, inadequate facilities, and insufficient professional competencies as major factors limiting the use of Web 2.0 technologies. Similarly, Anunobi and Ogbonna (2020) reported that librarians' unfamiliarity with Web 2.0 applications, limited opportunities for hands-on use, inadequate skills, and low professional interest contribute to their limited utilisztion. Although computer literacy among librarians is gradually improving, persistent challenges such as inadequate access to computers and poor internet infrastructure continue to undermine implementation efforts (Rehman & Shafique, 2011).

External and environmental factors also significantly influence the deployment of Web 2.0 technologies. The absences of clear institutional policies and slow internet connectivity have been identified as major obstacles to the effective integration of Web 2.0 applications into library services (Al-Kharousi, Jabur, & Al-Harrasi, 2016). Furthermore, erratic electricity supply remains a critical infrastructural challenge in Nigeria, negatively affecting internet access, electronic information resources, and the reliability of

web-based library services (Akinwale, 2013; Ajayi, Shorunke, & Aboyade, 2014).

Methodology

The study adopted a descriptive survey research design. The population of the study comprised 336 professional and paraprofessional library staff from three selected federal university libraries: Ahmadu Bello University, Zaria (188); Bayero University, Kano (138); and the Federal University of Birnin Kebbi (10). Data were collected using a structured questionnaire and analysed using descriptive statistics, including frequencies, percentages, and mean scores. The original methodology also indicates the use of regression analysis; however, no regression result is presented in the results section provided.

Results

Response Rate

A total of 336 copies of the questionnaire were distributed to library staff in the three selected federal university libraries. Of these, 265 copies were duly completed and returned, representing an overall response rate of 82.1%, while 71 copies, representing 17.9%, were not returned.

Table 1: Response Rate

Institution	Questionnaire Distributed	Questionnaire Returned	Returned (%)	Questionnaire Not Returned	Not Returned (%)
Ahmadu Bello University, Zaria	188	152	80.9	36	19.1
Bayero University, Kano	138	104	75.4	34	24.6
Federal University of Birnin Kebbi	10	9	90.0	1	10.0
Grand Total	**336**	**265**	**82.1**	**71**	**17.9**

Source: Field Data, 2025.

Table 1 shows that 265 out of the 336 questionnaires distributed were completed and returned, representing an overall response rate of 82.1%. The remaining 71 questionnaires, representing 17.9%, were not returned. The response rate was considered adequate for the analysis and interpretation of the study data.

Types of Web 2.0 Applications Used for Information Service Delivery

Table 2: Types of Web 2.0 Applications Used for Information Service Delivery

Web 2.0 Application	ABU Mean	BUK Mean	FUBK Mean	Overall Mean
Facebook	3.50	3.45	3.30	3.48
Twitter	2.70	2.60	2.00	2.64
Instagram	2.50	2.50	2.00	2.44
Telegram	2.30	2.10	2.00	2.27
YouTube	3.00	3.10	2.50	3.00
Snapchat	1.50	1.50	1.20	1.48
Skype	1.40	1.30	1.10	1.35

Web 2.0 Application	ABU Mean	BUK Mean	FUBK Mean	Overall Mean
Wikis	1.50	1.40	1.20	1.45
Library Blogs	1.40	1.40	1.20	1.39
WordPress	1.30	1.20	1.10	1.22
LinkedIn	2.00	2.10	1.50	1.91

Table 2 indicates that Facebook had the highest overall mean score (3.48), suggesting that it was the most frequently used Web 2.0 application among the library staff. According to the original findings, WhatsApp recorded an overall mean of 3.27, although its row was not visible in the table provided, while YouTube had an overall mean score of 3.00. Twitter (2.64), Instagram (2.44), and Telegram (2.27) recorded moderate levels of use.

Conversely, Snapchat (1.48), wikis (1.45), library blogs (1.39), Skype (1.35), and WordPress (1.22) recorded relatively low levels of use. These findings indicate that library staff relied more heavily on widely popular social networking and multimedia platforms than on collaborative and content-management applications.

Challenges Associated with the Use of Web 2.0 Applications

Table 3: Challenges Associated with the Use of Web 2.0 Applications for Information Service Delivery

S/N	Challenge	ABU (%)	BUK (%)	FUBK (%)	Average (%)
1	Lack of technological infrastructure	67	55	50	62.6
2	Digital literacy gaps	61	52	60	57.0
3	Resistance to change	52	48	70	53.2
4	Limited training opportunities	54	49	60	50.9
5	Funding constraints	51	49	60	51.3
6	Data privacy concerns	67	55	50	61.5
7	Lack of institutional support	55	52	80	53.6
8	Time constraints	45	42	30	43.8
9	Unreliable internet connectivity	44	36	20	39.2
10	User engagement challenges	86	78	80	81.1
11	Rapid technological changes	57	55	90	57.0
12	Compatibility issues	23	22	30	23.4
13	Cultural barriers	38	36	40	37.7
14	Lack of user awareness	59	55	70	57.0

Table 3 shows that user engagement challenges constituted the most significant challenge associated with the use of Web 2.0 applications for information service delivery, with an average of 81.1%. This was followed by lack of technological infrastructure (62.6%) and data privacy concerns (61.5%).

Digital literacy gaps, rapid technological changes, and lack of user awareness each recorded an average of 57.0%. Other notable

challenges included lack of institutional support (53.6%), resistance to change (53.2%), funding constraints (51.3%), and limited training opportunities (50.9%).

Time constraints (43.8%), unreliable internet connectivity (39.2%), cultural barriers (37.7%), and compatibility issues (23.4%) were relatively less prevalent. Overall, the findings demonstrate that the effective utilization of Web 2.0 applications is influenced by a combination of technological, institutional, human-capacity, and user-related challenges

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Discussion of Findings

The findings revealed that Facebook, WhatsApp, and YouTube were the most commonly used Web 2.0 applications among library staff in the selected federal university libraries. The high use of Facebook and WhatsApp is consistent with studies by Ebrahimzadeh Pirshahid et al. (2016) and Gmiterek (2023), which identified these platforms as important channels for communication and information dissemination. The moderate use of YouTube also indicates the growing adoption of multimedia platforms for information sharing and service delivery.

However, the relatively low use of Snapchat, Skype, wikis, WordPress, and library blogs suggests that several Web 2.0 applications with the potential to support collaborative learning, content creation, and diversified service delivery remain underutilized. This represents a missed opportunity for libraries to broaden their digital service platforms and engage users through a wider range of interactive technologies.

The findings further revealed that user engagement challenges constituted the most significant barrier to the effective use of Web 2.0 applications, with an average of 81.1%. This suggests that, despite the availability of Web 2.0 platforms, libraries may experience difficulties in attracting and sustaining active user participation.

Inadequate technological infrastructure and data privacy concerns were also identified as major challenges. Digital literacy gaps, rapid technological changes, and lack of user awareness further affected the effective use of Web 2.0 applications. These findings are consistent with Adeyinka and Taofeeqat (2016) and Baro et al. (2013), who identified infrastructural deficiencies, inadequate technical skills, and institutional limitations as major obstacles to the adoption of emerging technologies in libraries.

The findings also revealed that funding constraints and limited training opportunities contributed to the challenges associated with the use of Web 2.0 applications. This suggests the existence of broader institutional and resource-related limitations that require the attention of university management and library administrators.

Notably, the Federal University of Birnin Kebbi recorded relatively higher percentages in resistance to change (70%), lack of institutional support (80%), and rapid technological changes (90%). This may suggest that smaller institutions experience greater challenges in adopting and sustaining the use of emerging technologies due to differences in institutional capacity, infrastructure, and resource availability. These patterns are reflected in the reported findings of the study.

Conclusion

The study concludes that, despite the transformative potential of Web 2.0 applications for improving information service delivery, their effective use in federal university libraries in North-West Nigeria remains constrained by several challenges. The

most prominent challenges include low user engagement, inadequate technological infrastructure, data privacy concerns, digital literacy gaps, rapid technological changes, and lack of user awareness.

Other factors, such as inadequate institutional support, resistance to change, funding constraints, limited training opportunities, unreliable internet connectivity, and time constraints, also affect the effective utilization of Web 2.0 applications.

The findings further demonstrate that Facebook, WhatsApp, and YouTube are the most commonly used Web 2.0 applications, while platforms such as WordPress, Skype, wikis, and library blogs are comparatively underutilized. This indicates that library staff tend to rely more heavily on popular social networking and multimedia platforms than on other collaborative and content-development tools.

Therefore, strategic interventions aimed at improving digital competencies, strengthening technological infrastructure, increasing institutional support, and promoting user engagement are necessary to enhance the effective utilization of Web 2.0 applications for information service delivery in federal university libraries in North-West Nigeria.

Recommendations

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

1. Federal university libraries should organise regular training and capacity-building programmes to improve the Digital literacy, technical competence, and practical skills of library staff in the use of Web 2.0 applications.
2. University management and relevant stakeholders should invest in adequate ICT infrastructure, including computers, reliable internet connectivity, and other technological facilities required for effective Web 2.0-based information service delivery.
3. Federal university libraries should advocate for increased budgetary allocations from university management and other relevant stakeholders to support the acquisition, implementation, maintenance, and sustainability of Web 2.0 technologies.
4. University and library management should develop supportive policies and provide the necessary administrative and technical support to encourage the adoption and effective use of Web 2.0 applications.
5. Libraries should develop effective strategies for creating awareness and encouraging users to actively engage with Web 2.0-based library services.
6. Libraries should establish appropriate guidelines and procedures for protecting users' privacy and ensuring the responsible use of data on Web 2.0 platforms.
7. Library management should continuously monitor emerging technologies and provide opportunities for staff to update their skills in response to rapid technological changes.

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