

Impact of Digital Technologies on Resources and Services of Public Libraries in Maiduguri: A Case Study of Borno State Public Library Board, Maiduguri.

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Abstract

This study examined the impact of digital technologies on the resources and services of public libraries, using Borno State Public Library, Maiduguri, as a case study. Specifically, the study investigated the level of awareness, extent of integration, perceived impact, and challenges associated with the use of digital technologies, as well as the influence of awareness on integration and challenges on library services. A descriptive survey design was adopted, and data were collected from 58 library staff using a structured questionnaire. Data were analyzed using frequency counts, percentages, mean scores, and regression analysis.

The findings revealed a low level of awareness of digital technologies (cumulative mean = 1.82) and a correspondingly low level of integration (cumulative mean = 1.99). The impact of digital technologies on resources and services was moderate (cumulative mean = 1.97), while challenges of integration were high (cumulative mean = 3.2), including inadequate funding, poor internet access, and limited digital literacy. Regression results showed that awareness significantly influences the integration of digital technologies ($\beta = 0.64$, $p < 0.05$), while challenges significantly and negatively affect library resources and services ($\beta = -0.60$, $p < 0.05$).

The study concludes that improving awareness and addressing infrastructural and skill-related barriers are essential for enhancing digital transformation in public libraries. It recommends increased investment in digital infrastructure, staff training, and awareness programmes to strengthen service delivery and ensure effective integration of digital technologies.

Keyword: Digital Technologies; Resources and Services; Public Libraries; Maiduguri; Borno State Public Library Board

Introduction

The rapid advancement of digital technologies has significantly transformed the operations and service delivery of libraries across the world, particularly public libraries that are established to provide equitable access to information for diverse communities. Traditionally, public libraries mainly depended on print collections and face-to-face services to fulfil users' educational, informational, and recreational needs (Ifidon & Ifidon, 2007). However, the global shift toward digitalisation has redefined these traditional roles by introducing electronic resources, online databases, digital archives, and e-library platforms that allow faster information access and improved organisation of resources (Ebisi & Arua, 2018; Ayre, 2016). Public libraries are increasingly integrating Information and Communication Technology (ICT) tools into their operations to support digital literacy, enhance information dissemination, and extend services beyond the physical boundaries of the library (Iwhiwhu & Okorodudu, 2012; Ikeagwuani, Anoka & Ugochukwu, 2020). Digital technologies such as e-books, e-journals, multimedia resources, social networking platforms, and institutional repositories have broadened the scope of library services and enabled libraries to engage users remotely through websites, blogs, online platforms, and social media channels (Slatvinska, Demchenko, Tretiak, Hnatyuk & Yarema, 2022; Kapterev, 2023). Consequently, libraries are gradually evolving from traditional physical spaces into hybrid information hubs that facilitate knowledge sharing, digital communication, and collaborative learning. This transformation has also influenced library collections, staff responsibilities, and user expectations, as electronic media increasingly complement or replace traditional print resources while enabling users to access information anytime and from any location (Hussain & Lavanya, 2014).

Despite these advancements, the adoption and effective utilisation of digital technologies in public libraries particularly in developing countries remain constrained by several structural and socio-economic challenges (Ajani et al., 2025). Public libraries often face difficulties related to inadequate funding, limited technological infrastructure, insufficient staff training, and low levels of digital literacy among both librarians and users (Etebu & Zacchaeus, 2020). These challenges are more pronounced in regions such as Maiduguri in Borno State, where socio-economic conditions and security concerns further complicate the integration of digital technologies into library operations (Mohammed, 2019). Nevertheless, digital technologies hold considerable potential for improving library services by expanding access to diverse information resources such as e-books, online journals, and multimedia materials that support the educational and informational needs of the community (Nkanu & Okon, 2010; Ajani, Tella & Oladokun, 2024). The public library plays a critical role as a community information centre that promotes literacy, lifelong learning, and access to knowledge for individuals from various socio-economic backgrounds (Abubakar, 2013). However, the limited availability of digital infrastructure, skilled personnel, and sustainable funding continues to hinder the full implementation of digital services such as online databases, virtual learning platforms, and remote access systems (Ajani, Abdullahi, Ilori & Rasaan, 2023). While ICT innovations have created opportunities for improved efficiency, productivity, and broader information access, libraries must also address issues related to digital literacy, equitable access, and the balance between digital and traditional library services (Oghenetega, Umeji & Obue, 2014; Eunice & Rachael, 2023). Consequently, public libraries must continually adapt to technological changes by integrating digital technologies into their services

in order to remain relevant and effectively meet the evolving information needs of their communities.

The Borno State Public Library in Maiduguri, Nigeria, is a key public information centre that promotes knowledge dissemination and literacy. It offers access to various resources, such as books, newspapers, and digital content, catering to students, researchers, and the general public. The library supports learning and community development through reading programmes and information literacy initiatives aimed at enhancing literacy and lifelong learning in the region.

Statement of the Problems

Despite the vital roles the public libraries play towards community information services, social inclusion and engagement in the developed societies, the scenario in the less developed countries, Nigeria and Borno state conveys a contrary narrative. The researcher's physical visit to the Borno state library, the site for the public library reveals a picture of gross inactivity, low patronage amid inadequate and outdated information resources. The e-library section is still under construction after the 2024 flood disaster seems to have been abandoned to political power as the government remains the only financier of the library. Further obvious issue include inadequate resources that are typical of the public libraries, in addition to unconducive library environment that negates the socialization of the library users. Low digital literacy of the library staff increases the prevailing problems as the staff will exhibit the fear of job loss. Moreover, the roles of digital technologies in resources and services of the public libraries, especially the Borno State public library has not been empirically researched. These are some of the gaps this study aims to fill in study of the impact of digital technologies on resources and services of public libraries with Borno state public library as the case study.

Objectives of the Study

The objectives of the study are to determine:

1. The level of Awareness of Digital Technologies in Borno State Public Library
2. Level of Integration of Digital Technologies in Borno State Public Library
3. Impact of Digital Technologies on Resources and Services of Borno State Public Library
4. Challenges of Integration of Digital Technologies in Borno State Public Library
5. The impact of level of Awareness of Digital Technologies on Level of Integration of Digital Technologies in Borno State Public Library
6. Challenges of Integration of Digital Technologies on Resources and Services of Borno State Public Library

Research Hypothesis

H01: The level of Awareness of Digital Technologies has no significant influence on the level of Integration of Digital Technologies in the Borno State Public Library

H02: Challenges of Integration of Digital Technologies have no significant influence on the Resources and Services of Borno State Public Libraries

Empirical Literature Review on Awareness of Digital Technologies in Public Libraries

Empirical studies increasingly emphasise the significance of awareness of digital technologies in public libraries, particularly as libraries transition from traditional information repositories to hybrid digital information centres. The integration of digital technologies such as e-books, online databases, digital archives, and internet-based services has expanded access to information and transformed the operational structure of libraries (Hazan & Ayub, 2024). However, the effectiveness of these technologies largely depends on the level of awareness among both library staff and users (Kine & Davidsons, 2022). Scholars therefore argue that awareness constitutes a foundational factor influencing the adoption, utilisation, and sustainability of digital library services.

Several empirical investigations have examined the relationship between awareness and the utilisation of digital resources. For instance, Sarangan and Shivraj (2017), in a study conducted in Tanzanian libraries, reported that low awareness among library users and staff significantly contributed to the underutilisation of digital resources. Similarly, Ajisebutu, Adetayo, and Otuyalo (2024) demonstrated that awareness-building initiatives such as workshops, training sessions, and information campaigns substantially improved user engagement with digital services in Nigerian public libraries. These findings collectively indicate that awareness programmes play a crucial role in maximising the benefits of digital technologies in library environments.

Furthermore, empirical evidence highlights the pivotal role of library staff in promoting awareness and facilitating the effective use of digital technologies. Osinulu (2021) found that library personnel serve as primary intermediaries between digital resources and users; therefore, their level of digital literacy and awareness directly affects patrons' ability to access and utilise digital services. The study revealed that regular training programmes significantly enhanced staff capacity to guide users in navigating digital resources, ultimately increasing the level of technology adoption within libraries.

In addition to staff competency, socio-economic and infrastructural factors are known to have an influence on awareness levels. Manžuch and Macevičiūtė (2020) observed that public libraries in developed countries tend to exhibit higher levels of digital awareness due to stronger technological infrastructure, better funding, and comprehensive digital literacy initiatives. Conversely, libraries in developing regions often encounter constraints such as limited technological infrastructure and inadequate financial resources, which restrict awareness and adoption of digital resources (Osinulu, 2020). Supporting this perspective, Bello and Adepegba (2023) reported that poor funding in Nigerian public libraries limits the implementation of effective digital awareness campaigns, thereby reducing public engagement with available digital services.

Further studies also highlight the importance of strategic outreach and marketing in promoting awareness of digital technologies. Kutu and Olajide (2018) found that libraries that actively employ promotional strategies such as social media platforms, community workshops, and partnerships with educational institutions tend to achieve higher levels of public awareness and utilisation of digital services. In a related study, Ejechi (2018) observed that the use of social media significantly improved awareness levels among users of university libraries in Edo State. These

findings suggest that digital communication platforms can serve as effective tools for increasing awareness and encouraging user interaction with library technologies.

The increasing adoption of emerging technologies (ET) and information and communication technologies (ICT) has further transformed library services and user engagement (Roy, 2025). Relatively, Lee (2023) examined the roles of the public libraries in community resilience and sustainability during crises. In a case study of Koahsiung public library in Taiwan, the study fill the library services, community engagement and sustainable resilience gap during disaster recovery. Similarly, Dhar (2020) asserts that the integration of digital technologies has expanded access to library resources, enabling remote access to information through online databases, e-books, and digital archives. Supporting this argument, Bawden and Robinson (2009) report that digital resources contribute to more inclusive library environments by extending services to individuals who may face physical barriers to accessing traditional library facilities.

The application of specific technologies in public library services was further examined by Anttiroiko and Savolainen (2011) who found that the adoption of Web 2.0 technologies in public libraries improved communication, content sharing, and user interaction through tools such as blogs, RSS feeds, and social networking platforms. Similarly, Maideen and Oke (2019) and Jindal and Khan (2019) highlight the growing use of social networking sites (SNSs), including Facebook, Twitter, and Instagram, for delivering services such as reference support, current awareness services, and selective dissemination of information (SDI). These technologies enable libraries to interact with users more effectively while promoting their digital resources.

Despite these advancements, empirical studies continue to report significant challenges affecting the adoption and awareness of digital technologies in public libraries. Ike, Chinedu, and Umah (2023), in a survey of library staff in Anambra and Imo State public libraries, found that the overall level of digital awareness among staff was moderate, while the level of digital technology integration remained low. This was contrary to Wada et al (2025) which found that awareness of AI did not significantly predict information resource management in Nigerian Libraries. Furthermore, Krubu and Osawaru (2011) identified several barriers to the effective use of digital technologies in Nigerian libraries, including inadequate funding, insufficient staff training, unreliable power supply, and limited technological infrastructure. Other studies (Oghenetega, Umeji, & Obue, 2014; Okojie & Okiy, 2019) corroborate these findings, emphasising that institutional and infrastructural constraints significantly hinder the implementation of digital technologies in public libraries.

Moreover, the issue of the digital divide remains a persistent concern in the literature. Adeyeye (2024) found that Public libraries in southwest Nigeria offer programs aimed at developing basic digital skills for users. However, they encounter challenges like inadequate digital resources and limited staff expertise. Nevertheless, the presence of these programs indicates an acknowledgment of the importance of promoting digital literacy by the libraries. Consequently, public libraries have increasingly assumed the responsibility of offering digital literacy programmes to equip users with the skills needed to access and utilise digital resources effectively (Po-An Hsieh, Rai, & Keil, 2008).

In summary, empirical literature demonstrates that awareness of digital technologies is a critical determinant of their successful adoption and utilisation in public libraries. Studies consistently indicate that staff training, funding availability, technological infrastructure, and effective outreach strategies significantly influence awareness levels. While digital technologies have expanded the scope of library services and improved access to information, challenges such as inadequate funding, insufficient training, and infrastructural limitations continue to hinder their effective implementation, particularly in developing countries. Consequently, strengthening awareness initiatives and addressing these structural constraints remain essential for maximising the potential of digital technologies in public library systems.

Methodology

This study adopted a descriptive survey research design, which provides a systematic approach for collecting, measuring, and analysing data to address the research problem effectively. A research design serves as the blueprint that guides the overall process of data collection, measurement, and analysis in a study. The descriptive survey design was considered appropriate because it enables the researcher to obtain relevant and accurate information from respondents who are directly involved in the phenomenon under investigation. It also allows the researcher to examine existing conditions and determine the extent to which particular variables occur among the target population. This design is commonly used in social science research because of its efficiency in collecting data from participants quickly.

The population of the study consisted of 58 staff members of the Borno State Public Library, Maiduguri, including professional librarians and other supporting staff of the library board. Due to the manageable size of the population and accessibility of respondents, accidental sampling was employed to collect data from staff members who were readily available during the period of the study. The study data was collected using a structured questionnaire developed specifically for the research. A questionnaire, according to Kothari (2004), is a research instrument consisting of a set of questions arranged in a definite order on a form, which may include both structured and unstructured questions, as well as closed and open-ended responses. The questionnaire used in this study was divided into two sections. The questionnaires were administered using a face-to-face approach, and the process of completion and retrieval lasted approximately one week. The research data was analysed through a descriptive statistical technique, particularly frequency counts, percentages and mean scores for decision-making at an overall mean of 3.0. The results of the analysis were presented using tables and figures where necessary to enhance clarity and facilitate interpretation of the findings.

Analysis and Results

Table 1: Demographic Information of the Respondents. N=58

	Frequency	Percentage
Gender	37	64.8
	21	36.2
Qualification		
Masters	00	00
Bachelor	26	44.83
HND	10	17.24
Diploma	22	37.93
Masters	00	00

The Demographic data provides an overview of the respondents' gender and qualifications. In terms of gender, 37 respondents, representing 64.8%, are male, while 21 respondents, accounting for 36.2%, are female. This shows a male majority in the sample. Regarding qualifications, none of the respondents hold a master's degree. The largest group holds a bachelor's degree, with 26 individuals, or 44.83% of the respondents. Those with a diploma make up 37.93% (22 respondents), and individuals with a Higher National Diploma (HND) account for 17.24% (10 respondents). This indicates that most respondents hold either a bachelor's degree or a diploma, reflecting a moderate to advanced level of educational attainment among the sample.

Table 2: Extent of Awareness of Digital Technologies in Public Libraries. N=58

S/No	Statements	VLE	LE	HE	VHE	$\bar{X}$
1	The library provides access to digital resources (e-books, e-journals, etc.).	8 (13.8%)	10 (17.2%)	15 (25.9%)	25 (43.1%)	2.01
2	The library offers internet access for patrons.	6 (10.3%)	12 (20.7%)	20 (34.5%)	20 (34.5%)	2.07
3	The library has computer facilities available for public use.	4 (6.9%)	8 (13.8%)	16 (27.6%)	30 (51.7%)	1.76
4	The library has a user-friendly online catalog for searching library materials	7 (12.1%)	3 (5.7%)	19 (32.8%)	29 (50.0%)	1.79
5	The library provides digital literacy Programs or training.	8 (13.8%)	11 (19.0%)	15 (25.9%)	24 (41.4%)	2.05
6	The library actively uses social media or a website to engage with the Community.	9 (15.5%)	12 (20.7%)	22 (37.9%)	15 (25.9%)	2.26
Cumulative Mean						1.99

Table 2 provides data on the extent of awareness of digital technologies among respondents in public libraries in Borno State. Each question item reflects a different aspect of digital technology awareness, with responses categorised into four levels: Very Low Extent (VLE), Low Extent (LE), High Extent (HE), and Very High Extent (VHE). The responses are summarised by a mean score for each item, with a cumulative mean representing overall awareness. Digital technologies in the library have a mean score of 1.8, indicating that awareness is primarily at a low level, as most respondents selected Very Low Extent (23) and Low Extent (25), while only a few reported higher awareness levels. Awareness of online cataloguing and digital lending services has a mean of 1.7, again indicating a low level of awareness, with the majority of responses falling in the Very Low Extent (28) and Low Extent (23) categories. Digital literacy programmes in the library show a slightly higher mean of 1.9, although awareness remains low overall, with most respondents indicating Very Low Extent (19) and Low Extent (32). Awareness of library websites and apps also has a mean of 1.7, suggesting that respondents are largely unaware of these resources, as evidenced by the high frequency in the Very Low Extent (25) and Low Extent (29) categories. For

the statement "Overall digital awareness is impressive," the mean is 2.0, reflecting a marginally medium awareness level, yet still predominantly low, with 20 responses at Very Low Extent and 22 at Low Extent. The cumulative mean ($\bar{X}$) of 1.82 indicates that awareness of digital technologies among respondents is generally low across all areas assessed. This suggests that efforts to raise awareness and inform library users about digital resources and services are necessary in these public libraries.

Table 3: Level of Integration of Digital Technologies in Borno State Public Library. N=58

S/N	I am aware of	VLE	LE	HE	VHE	$\bar{X}$
1	Digital technologies in the library to ...	23 (39.7%)	25 (43.1%)	6 (10.3%)	4 (6.9%)	1.8
2	Online cataloguing, digital lending offered in your library to ...	28 (48.3%)	23 (39.7%)	5 (8.6%)	2 (3.4%)	1.7
3	Digital literacy program in your library to ...	19 (32.8%)	32 (55.2%)	2 (3.4%)	5 (8.6%)	1.9
4	Library websites and App to	25 (43.1%)	29 (50%)	2 (3.4%)	2 (3.4%)	1.7
5	Overall digital awareness is impressive to ...	20 (34.5%)	22 (39.7%)	12 (20.7%)	4 (6.9%)	2.0
Weighted Mean						1.83

The result from Table 3 showed that the library's use of social media/website has the highest mean score of 2.26, indicating strong engagement with the community. Computer facilities for public use has the lowest mean score of 1.76, indicating the potential need for improvement in providing computer facilities for public use. In summary, based on the findings, the library appears to excel in using social media/websites for community engagement and providing access to digital resources. However, there may be room for improvement in providing computer facilities for public use. The overall quality of library services and resources, as indicated by the grand mean of 1.99, is relatively low, with a mean ($\bar{X}$) score of approximately 1.99 on a scale of 1 to 4. This is an indication that the extent of digital integration in the two public libraries is low.

Table 4: Impact of Digital Technologies on Resources and Services of Borno State Public Libraries. N=58

S/No	Statements	VL	L	M	VH	$\bar{X}$
1	Limited utilization of digital resources and services by library patrons	22 (37.9%)	15 (25.9%)	13 (22.4%)	8 (13.8%)	1.57
2	Traditional library services is more than the ones by digital technology	11 (19.0%)	11 (19.0%)	16 (27.6%)	20 (34.5%)	1.80
3	A moderate number of patrons engage with digital resources and services	10 (17.2%)	12 (20.7%)	17 (29.3%)	19 (32.8%)	1.97
4	A move towards digital services while maintaining some traditional library offerings.	6 (10.3%)	15 (25.9%)	17 (29.3%)	20 (34.5%)	1.87
5	Traditional and digital services are mixed but digital technology services is little	12 (20.7%)	15 (25.9%)	12 (20.7%)	19 (32.8%)	2.50
6	More digital services and less traditional services	12 (20.7%)	13 (22.4%)	14 (24.1%)	19 (32.8%)	2.15
Cumulative Mean						1.97

The table illustrates respondents' perspectives on the impact of digital technologies on public library resources and services. A low $\bar{X}$ score of 1.57 indicates that library patrons make limited use of digital resources and services. Additionally, a mean score of 1.80 suggests that traditional library services still prevail over digital ones. There is a moderate level of engagement with digital resources, reflected in a $\bar{X}$ of 1.97, showing that some patrons are utilising these services to an extent. A gradual shift toward digital services is observed, with a $\bar{X}$ score of 1.87 indicating that digital offerings are being introduced alongside traditional services, though the two are maintained together. With a $\bar{X}$ of 2.50, the coexistence of traditional and digital services is evident, though digital technology usage remains somewhat limited. Furthermore, a $\bar{X}$ of 2.15 reflects an increase in digital services, though traditional services are still significant. The cumulative $\bar{X}$ of 1.97 highlights an overall moderate level of digital integration, where digital services are present but not yet widely utilised or fully embedded in the library's service model.

Table 5: Challenges of Integration of Digital Technologies in Borno State Public Libraries.
N=58

S/No	Statements	SD	D	A	SA	$\bar{X}$
1	Insufficient access to reliable internet	3 (5.2%)	4 (6.9%)	21 (36.2%)	30 (51.7%)	3.3
2	Connectivity and power supply is limited	8 (13.8%)	6 (10.3%)	19 (32.8%)	25 (43.1%)	3.0
3	Insufficient budgets to invest in modern digital technologies	4 (6.9%)	3 (5.2%)	23 (39.7%)	28 (48.3%)	3.2
4	Inadequate digital literacy skills for library staff	4 (6.9%)	3 (5.2%)	17 (29.3%)	34 (58.6%)	3.4
5	High cost of Acquisition and maintenance of digital content	11 (19.0%)	2 (3.4%)	21 (36.2%)	21 (36.2%)	2.9
6	Security of digital service can be complex	5 (8.6%)	5 (8.6%)	21 (36.2%)	27 (46.6%)	3.2
7	Fear of change to digital technology	2 (4.3%)	3 (5.2%)	25 (43.1%)	27 (46.6%)	3.3
8	Cost of staff training for digital operations	5 (8.6%)	4 (6.9%)	24 (41.4%)	25 (43.1%)	3.2
9	Challenge of technical supports	8 (13.8%)	9 (15.5%)	21 (36.2%)	20 (34.5%)	2.9
10	Copyright laws may limit integration of digital technologies and services	0 (0.0%)	0 (0.0%)	24 (41.4%)	34 (58.6%)	3.6

The table presents the challenges faced in integrating digital technologies into public libraries in Borno State. The highest $\bar{X}$ score of 3.6, related to copyright laws, indicates that restrictions on digital content rights pose a significant obstacle. Insufficient access to reliable internet and the fear

of shifting to digital technologies both have $\bar{X}$ scores of 3.3, highlighting that limited internet availability and resistance to technological change are prominent challenges. The cumulative $\bar{X}$ score of 3.2 underscores that, on average, the respondents perceive these challenges as substantial barriers to digital integration. Connectivity and power supply limitations have a mean of 3.0, suggesting that these infrastructural issues also hinder digital advancements. The high cost associated with acquiring and maintaining digital resources ($\bar{X}$ of 2.9) and technical support challenges (also with a $\bar{X}$ of 2.9) present further financial and operational difficulties for these libraries. Inadequate digital literacy skills for library staff, with a $\bar{X}$ of 3.4, indicate that a lack of staff expertise is a significant hindrance, requiring investment in training. Similarly, the cost of staff training has a $\bar{X}$ of 3.2, showing that budget limitations also impact skill development. Overall, the findings highlight key barriers to the successful integration of digital technologies in public library in Borno State, with infrastructural, financial, and skill-related issues being particularly notable.

H01: The level of Awareness of Digital Technologies has no significant influence on the level of Integration of Digital Technologies in the Borno State Public Library

Table 6: The Summary of the Simple Linear Regression on Awareness of Digital Technologies

Model	Predictor Variable	R^2	df	β	t -value	Sig.
Model 1	Awareness of Digital Technologies → level of Integration of Digital Technologies in the Borno State Public Library	0.41	56	0.64	5.64	0.000

The regression result in table 6 reveal that awareness of digital technologies has a standardized beta (β) of 0.64, indicating that every one unit increase in awareness of digital technologies increases integration by 64%. The t -value of 5.64 and p -value of 0.000 ($p < 0.05$) indicate that this relationship is statistically significant. Furthermore, the R^2 value of 0.41 suggests that awareness explains 41% of the variation in the level of integration, which is substantial. There is a significant positive influence of awareness of digital technologies on their integration in the Borno State Public Library, the null hypothesis is hereby rejected

H02: Challenges of Integration of Digital Technologies have no significant influence on the Resources and Services of Borno State Public Libraries

Table 7: The Summary of the Simple Linear Regression on integration of Digital Technologies

Model	Predictor Variable	R^2	df	β	t -value	Sig.
Model 1	Challenges of Digital Integration → Resources & Services in the Borno State Public Library	0.36	56	-0.60	-4.46	0.000

Summary of regression analysis (table 7) indicate that digital integration challenges have a standardized negative beta (β) of -0.60, demonstrating that one unit increase in these challenges causes 60% decrease on library resources and services. The t -value of -4.46 and the p -value of 0.000 ($p < 0.05$) confirm that this relationship is statistically significant. The R^2 value of 0.36 suggests that these challenges explain 36% of the variance in resources and services, therefore, the null hypothesis is rejected.

Discussion

Regarding the awareness of digital technologies, the overall digital awareness, as indicated by the grand mean ($\bar{X}$), is moderate, with a score of approximately 1.82 on a scale of 1 to 4. The result of this study is in line with Aydinlar, Mavi, Kutukcu, Kirimli and Alis (2023), who discovered that the extent to which students benefit from the digital literacy supported is minimal. Thus, health-based university students are encouraged to acquire the computer skills required by today's clinical settings. Also, the study of Al-Thalabi (2021) indicated that the mathematics teachers' awareness of digital educational technologies was of a medium agreement score, with an arithmetic mean of (3.08) and a percentage of (61.6%). The awareness of the cognitive dimension of technologies obtained a medium agreement score, with an arithmetic mean of 3.36 and a percentage of 67.2%. Also, the awareness of the skill dimension of technologies obtained a medium agreement score, with an arithmetic mean of (2.80) and a percentage of (55.9%). This result was contradicted by Wada et al (2025) which found that awareness of AI has no significant influence in resource management in Nigerian libraries.

On the integration of digital technologies in the Borno State public library, the result in table 4.3, which revealed a relatively low level, is in agreement with the study of Ike, Chinedu, and Umah (2023), who discovered a low extent of integration of digital technologies in public libraries in two states in southeast Nigeria. Also, the research finding of Bondar (2023) indicates that integrating electronic resources into the library environment of higher education institutions provides a range of benefits, such as increased accessibility and diversity of information resources, improved service, and user convenience, which disagrees with the result in Table 4.3.

Regarding the impact of digital technology, the result indicate a low impact as revealed by the disagreement options among the respondents. This result is contrary to the study of Solomon-Uwakwe, Njoku and Mbagwu (2016), which reveals that ICT has positively impacted acquisition, circulation, cataloguing and serials operations and services of Imo State Public Library, Owerri. Furthermore, the findings of Guto and Wasike (2022) showed that the application and usage of

information communication technologies (ICTs) had significant impacts on library service provision, such as circulation, e-books, internet services, OPAC and increased work output.

On the challenges of digital technologies in public libraries, the result is in accord with several studies; Bondar's (2023) study aligns with the current research, highlighting key challenges that need attention, including ensuring information security, helping library staff adapt to emerging technologies, and developing effective strategies for implementing digital innovations. Similarly, Solomon-Uwakwe, Njoku, and Mbagwu (2016) identified obstacles to ICT adoption in Imo State's public libraries, such as the absence of an ICT policy, insufficient funding, poor maintenance, lack of trained ICT staff, and inconsistent power supply, which also resonate with the present study's findings. Shim and Jhaver (2023) reported digital governance issues among subscribing libraries, including the inadequate quality of acquired content, limited control over curation, and minimal understanding of distribution services.

In addition, Obiadazie, Eyiuche, and Nwankwo (2019) noted further challenges hindering the computerisation of library services in Anambra and Imo States, such as unreliable power supply, lack of air-conditioned rooms for ICT facilities, and limited ICT knowledge among librarians. Robert and Eyong (2023) also identified issues such as poor funding, erratic electricity supply, and frequent system breakdowns as challenges to digital collection development. Other issues include insufficient resource-sharing arrangements and the lack of compatible software, among others.

Conclusion

The analysis results suggest that respondents generally have low awareness of digital technologies across all evaluated areas. On integration of digital technologies, the overall quality of library services and resources, as indicated by the grand mean of 1.99, is relatively low, with a score of approximately 1.99 on a scale of 1 to 4. This is an indication that the extent of digital integration in the two public libraries is low.

The impact of the integration of digital technologies on the resources and services of public libraries is moderate, with a cumulative mean of 1.97, highlighting an overall moderate level of digital integration, where digital services are present but not yet widely utilised or fully embedded in the library's service model.

On challenges of integration of digital technologies in public library services. The findings highlight key barriers to the successful integration of digital technologies in public libraries in Borno State, with infrastructural, financial, and skill-related issues being particularly notable.

5.3. Recommendation

Based on the findings, the study recommended that:

1. There should be vibrant awareness creation on the importance of digital technologies integration in the resources and services of the public libraries.
2. Further, there should be an update in the integration of digital technologies to suit the growth in knowledge and innovation in the information space.

3. There should be an understanding of the impact of the digital technologies in the library, the impact should be measured regularly so that there will be a continuity in acquisition.
4. The management should take into account of all the challenges of the adoption of digital technologies, and Make policies that will cater for the challenges.

References

- Abubakar, B. M. (2013). Poverty alleviation through strategic public library services in Nigeria in the 21st century: A model. *IFLA Journal*, 39(1), 4-14. doi:10.1177/0340035212472283
- Adeyeye, S. V. (2024). Bridging the digital divide: Librarians' role in empowering Nigerian communities through digital competencies and advocacy. *Library Trends*, 72(4), 712-726. doi:10.1353/lib.2024.a949579
- Ahmad, R., & Rafiq, M. (2022). Assessing the preparedness of university libraries for digital preservation. *The Journal of Academic Librarianship*, 48(6), 102617
- Aiyebilehin, J. A., Onyam, I. D. & Akpom, C. C. (2018). Creating makerspaces in nigerian public libraries as a strategy for attaining national integration and development. *International journal of knowledge content development and technology*, 8 (4), 19-31
- Ajani, Y. A., Abdullahi, F., Ilori, O. O., & Rasaki, M. O. (2023). Readiness to Adopt Robotic Technology in Nigerian Public Libraries: Strategies for Improving Information Service Delivery. *Library Philosophy and Practice (e-journal)*. 8061. <https://digitalcommons.unl.edu/libphilprac/8061>
- Ajani, Y. A., Tella, A., & Oladokun, B. D. (2024). Social innovation in Nigerian public libraries: A roadmap for navigating the challenges and opportunities of inclusivity and diversity in the 5IR era. *Business Information Review*, 02663821241289845.
- Ajani, Y. A., Akin-Fakorede, O. O., Ama-Abasi, R. D., Onanuga, A. O., Amaechi, N. M., Ayegun, I. B., ... Abubakar, S. (2025). Knowledge democratization and accessibility in the fifth Industrial Revolution: A qualitative study of sustainability in Nigerian public libraries. *IFLA Journal*. doi:10.1177/03400352251385056
- Ajisebutu, A. E., Adetayo, A. J., & Otuyalo, M. A. (2024). Librarians' awareness and utilization of open access electronic journals in Nigerian University libraries. *The Reference Librarian*, 1-25. doi:10.1080/02763877.2024.2413041
- Al-Thalabi, R. O. A., & Al-Maliki, A. M. H. (2021). The Extent of Awareness of Intermediate Stage Mathematics Teachers about Digital Educational Technologies in Jeddah, Saudi Arabia. *Journal of Educational and Psychological Sciences*, 5(5) : 23 - 47
- Ali, K. S. & Khaisar, M. K. (2017). *Emerging web based technologies for library and information services in the knowledge era. National Level Conference on Professionalism*

in Library and Information Services for User Empowerment: Opportunities and Challenges At: Mangalore University, Mangalore.

- Ameen, K. (2017). The need and impact of learning personality development & communication skills'' in LIS education: A case study. *Malaysian Journal of Library & Information Science*, 18(1), 15–25
- Amrohi, R. A., Garg, A. & Chauhan, P. (2015). Application of web technology in special libraries: a challenge before library and information professionals in digital era. *International Journal of Digital Library Service*, 6, 7-15
- Anttiroiko, A., & Savolainen, R. (2011). Towards library 2.0: The adoption of Web 2.0 technologies in public libraries. *Libri*, 61(2). doi:10.1515/libr.2011.008
- Aydınlar, A., Mavi, A., Kütükçü, E., Kırımlı, E. E., Alış, D., Akın, A., & Altıntaş, L. (2024). Awareness and level of digital literacy among students receiving health-based education. *BMC Medical Education*, 24(1). doi:10.1186/s12909-024-05025-w
- Ayre, L. B. (2016). The impact of information technology on public libraries. *Public Library Quarterly*, 35(4), 355-361. doi:10.1080/01616846.2016.1245009
- Bawden, D., & Robinson, L. (2008). The dark side of information: Overload, anxiety and other paradoxes and pathologies. *Journal of Information Science*, 35(2), 180-191. doi:10.1177/01655551508095781
- Bello, B. P., & Adepegba, I. M. (2023). Digital Transformation: Revitalizing Public Libraries as Inclusive Hubs for National Development. *Library Philosophy and Practice (e-journal)*. 8061. <https://digitalcommons.unl.edu/libphilprac/8061>
- Bertot, J. C., Real, B., & Lee, J. (2017). Public library engagement with community-led digital inclusion initiatives: A national survey. *Information Policy and Libraries*, 48(1), 1-33.
- Besser, H. (2002). The next stage: Moving from isolation to integration of digital collections. *First Monday*, 7(6).
- Bondar, I. (2023) Integration of Electronic Resources in Library Environment of Higher Education Institutions: Advantages and Challenges. *Scientific journal Library Science Record Studies Informology*. DOI:10.32461/2409-9805.2.2023.284673.
- Choukhande, V. G. (2003). *Librarians' computer awareness and use of its application in college libraries of Yavatmal district* (Maharashtra). https://ir.inflibnet.ac.in/bitstream/1944/220/1/cali_51.pdf
- Dhar, P. L. (2020). *Digital transformation of libraries and information centers: Management of digital content and services*. IGI Global.
- Dourish, P., & Bellotti, V. (1992). *Awareness and Coordination in Shared Workspaces*. In CSCW 92 Proceedings (pp. 107–114). [doi.10.1145/143457.143468](https://doi.org/10.1145/143457.143468)

- Ebisi, E. M., & Arua, G. N. (2018). Knowledge management in libraries in the 21st Century. *Information Impact: Journal of Information and Knowledge Management*, 9(3), 72-83.
- Ejechi, V. (2018). *Awareness and Perception of Sustainable Development Goals (SDGs), among, Library Personnel in Edo state University Library*. Retrieved September, 2023. <https://www.researchgate.net/publication/323391987>
- Ekhaguosa, V. O., Irughe, M., & Egharevba, E. (2021). Access to E-Resources by Librarians in University Libraries in Niger Delta Region, Nigeria. *Library Philosophy and Practice (ejournal)*. 6727. <https://digitalcommons.unl.edu/libphilprac/6727>
- Etebu, A. T., & Zacchaeus, C. M. (2020). Innovative Library Services (ILS) in Nigeria: Challenges and Way forward. *International Journal of Research and Innovation in Social Science*, 4(7), 87-94.
- Eunice, A. O., & Rachael, A. T. (2023). ICT Application and Information Service Delivery in South-West Nigeria's Public Polytechnic Libraries. *Library Philosophy and Practice (ejournal)*. 8049. <https://digitalcommons.unl.edu/libphilprac/8049>
- Gafoor, K. A. (2012). Considerations in the Measurement of Awareness. In Okonoko and Eruvwe (2020). Awareness of information and communication technology-based information resources in library user education programmes in colleges of education in Southern Nigeria. *Information Impact: Journal of Information and Knowledge Management*, 11(4), 156-171.
- Ghosh, D., & Pramanik, S. (2020). Sustainability of digital libraries: A review. *Journal of Cultural Heritage Management and Sustainable Development*, 10(1), 53-71.
- Guto, R., & Wasike, J. (2022). *Maximizing the Value of Information Communication Technologies (ICTs) and Its Implications on Library Operations in Public Universities in Kenya: Potential and Challenges*. Retrieved from: <http://repository.chuka.ac.ke/bitstream/handle/>
- Gutwin, C., & Greenberg, S. (2000). The Effects of Workspace Awareness Support on the Usability of Real-Time. *Distributed Groupware*, 6(3), 243-281.
- Hazan, H., & Ayub, Z. (2024). Information technology integration strategy in public library services. *Journal of Education, Humaniora and Social Sciences (JEHSS)*, 7(2), 424-431. doi:10.34007/jehss.v7i2.2363
- Hussain A. & Lavanya N. (2014), the impact of ICTS in library and information Services at Indus Business Academy, Bangalore. *IJKM* 1(3), 1-14.
- Hussain, A. (2023). Use of geographical information system (GIS) application in public libraries. *Library Hi Tech News*, 40, 9-14.
- Hussain, M., & Idrees, H. (2021). The public libraries perspective in Pakistan: A study on empirical problems. *Library Philosophy and Practice (e-journal)*. 5177. <https://digitalcommons.unl.edu/libphilprac/5177>

- Ifidon, S. E., & Ifidon, E. I. (2007). *New Directions in African Library Management*. Spectrum Books.
- Ike, N.I, Chinedu, O.N, & Umah, C. (2023). Impact of Digital Technologies on Resources and Services of Public Libraries in Anambra and Imo State. *Library Philosophy and Practice (e-journal)*. 8017. <https://digitalcommons.unl.edu/libphilprac/8017>
- Ikeagwuani, J. A., Anoka, S. N. & Ugochukwu, K. M. (2020) Impact of information communication technology (ICTS) in the provision of reference services in the academic libraries in Nigeria: A study of COOU library. *International Journal of Social Sciences and Humanities Reviews* 10(1), 49 – 59,
- Iwhiwhu, B.E. and Okorodudu, P.O. (2012) Public Library Information Resources, Facilities, and Services: User Satisfaction with the Edo State Central Library, Benin-City, Nigeria. *Library Philosophy and Practice*, 747. <http://unllib.unl.edu/lpp/retrieved>
- Jain, S. J. & Sinnaraja, R. (2019). *Open Source Technologies for Libraries: Trends and Developments*. <https://www.researchgate.net/publication/342493355>
- Jindal, R & Khan, J. (2019). Emerging ICT technologies and the academic libraries. *Research Journal of Library Sciences (e- journal)*. Available at www.isca.in, www.isca.me
- Kaba, A., & Ramaiah, C. K. (2014). *Digital resources and services: An investigation of GCC academic Libraries*. Proceedings of the SLA-AGC 20th Annual Conference Doha, Qatar, 25-27 March 2014
- Kapterev, A. I. (2023). Conceptual foundations of digital transformation of libraries. *Bibliotekovedenie Russian Journal of Library Science*, 72(1), 7-20. doi:10.25281/0869-608x-2023-72-1-7-20
- Kine, K., & Davidsons, A. (2021). Latvian public libraries as a resource, cooperation partner and initiator for promoting media literacy and civic participation in local communities. *Journal of Librarianship and Information Science*, 54(4), 640-651. doi:10.1177/09610006211036736.
- Kothari, C.R (2014) *Research Methodology Methods & Techniques* (Second Revised Edition). Newage International Publishers
- Krubu, D. E & Osawaru, K. E. (2011). The Impact of Information and Communication (ICT) in Nigerian University. *Library Philosophy and Practice (e-journal)*. 583. <https://digitalcommons.unl.edu/libphilprac/583>
- Kutu, J. O., & Olabode, O. (2018). Marketing of information products and services in public libraries in south west, Nigeria. *International Journal of Library and Information Science*, 10(6), 54-61. doi:10.5897/ijlis2017.0798
- Lee, P. (2023). From community engagement to community resilience: The evolving role of public libraries. *Public Library Quarterly*, 43(3), 339-366. doi:10.1080/01616846.2023.2251860

- Lucky U. O., Umeji, E. C. & Obue, C. N. (2014). Challenges Associated with the Use of ICT Facilities in Public Library of Nigeria. *Development Country Studies* 4(22). 1-5
- Lund, C. A. (2011). Digital literacy and libraries: A concept definition and discussion. *Journal of Documentation*, 67(2), 278-297.
- Maideen, S. & Oke, O. C. (2019). *A Study on Emerging Technology trends in Academic Libraries: An Overview. Reshaping of Librarianship, Innovations and Transformation*. ICRLIT – 2019: e-Proceedings, 163-168.
- Manžuch, Z., & Macevičiūtė, E. (2019). Getting ready to reduce the digital divide: Scenarios of Lithuanian public libraries. *Journal of the Association for Information Science and Technology*, 71(10), 1205-1217. doi:10.1002/asi.24324
- McCook, K. D. L. P., Bossaller, J. S., & Thomas, F. (2018). *Introduction to public librarianship (3rd ed.)*. American Library Association.
- Mohammed, B. B. (2019). *Provision of public library services to meet the information needs of rural dwellers in the North-Western zone of Nigeria* (Doctoral dissertation). University of KwaZulu-Natal, Pietermaritzburg, South Africa.
<https://core.ac.uk/download/pdf/250414247.pdf>
- Nkanu, W. O., & Okon, H. I. (2010). Digital divide: Bridging the gap through ICT in Nigerian libraries. *Philosophy and Practice (e-journal)*. 492.
<http://digitalcommons.unl.edu/libphilprac/492>
- Obiadazie, R., Eyiuche, M. and Obiadazie, N. N. (2019) Computerization of library services in Anambra state: Challenges and prospects. Retrieved from
<https://www.researchgate.net/publication/341781617>.
- Oghenetega, L. U., Umeji, E. C. & Obue, C. N. (2014). Challenges Associated with the Use of ICT Facilities in Public Library of Nigeria. *Developing Country Studies*, 4 (22): 1-5
- Okojie, V. & Okiy, R. (2019). *Public Libraries and the Development Agenda in Nigeria*. IFLA WLIC, Athens. Public Libraries and the Development Agenda in Nigeria (ifla.org)
- Okwu, E., Okwu, N. E., & Oladokun, B. D. (2024, May). New Technological Trends and Application in Libraries: An Overview. In *Seminars in Medical Writing and Education* (Vol. 3, pp. 64-64).
- Osinulu, L. (2021). Digital Literacy Competencies among Library Officers in State and Federal Universities in Ogun State, Nigeria: *Digital Literacy Skills*. *World Libraries*, 25(1).
- Osinulu, L. F. (2020). Awareness and use of electronic information resources by students of college of health sciences in Olabisi Onabanjo University, Nigeria. *Information Impact: Journal of Information and Knowledge Management*, 11(3), 1-11.
- Po-An Hsieh, J. J., Rai, A., & Keil, M. (2008). Understanding digital inequality: Comparing continued use behavioral models of the socio-economically advantaged and Disadvantaged1. *MIS Quarterly*, 32(1), 97-126. doi:10.2307/25148830

- Rafi, M., Ali, S., & Ahmad, A. (2016). Administrative challenges to public libraries in Khyber Pakhtunkhwa Pakistan: An empirical study. *Journal of Social Science Studies*, 15(1), 32–48.
- Ray, A.K., & Ramesh, D.B. (2017). Open Source Software (OSS) for Management of Library and Information Services: An Overview. *International Journal of Library and Information Studies*. 7(2), 20-31.
- Robert, B. E., & Eyong, I. U. Problems and Challenges of Digital Collection Development In University Libraries in Akwa-Ibom State, Nigeria. *Journal of Library and Information Technology Trends*, 161-174
- Roy, K. P. (2025). Public Libraries in the Digital Era: Strategies for Relevance, Access and Community Engagement. *Int J of Library and Information Science*, 14(1), 46-59.
- Sarangan, K., & Shivraj, K. S. (2017). User Awareness and Use of Web Based Library Services among Engineering Students in Coimbatore Region: A Study. *Asian Journal of Research in Social Sciences and Humanities*, 7(1), 624-631. doi:10.5958/2249-7315.2016.01397.6
- Savard, R. & Dione, B. (2007). *Introduction in Managing Technologies and Automated Library Systems in Developing Countries: Open Source vs Commercial Options*: Proceedings of the IFLA Pre-Conference Satellite Meeting Dakar, Sénégal, August 15-16 2007.
- Shehu, M., Shehu, H., & Ode, M. B. (2018). Pattern of Smartphone Use Among Clinical Medical Students of Bingham University Teaching Hospital, Jos. *Central African Journal of Public Health*, 4, (5), 137-142.
- Shim, Y., & Jhaver, S. (2026). Understanding the governance challenges of public libraries subscribing to digital content distributors. *The Library Quarterly*, 96(1), 100-121. doi:10.1086/738388
- Valeria, S., Vitaliia, D., Kateryna, T., Rostyslav, H., & Oleg, Y. (2022). The impact of blockchain technology on international trade and financial business. *Universal Journal of Accounting and Finance*, 10(1), 102-112. doi:10.13189/ujaf.2022.100111
- Solomon-Uwakwe, B., Njoku I. N. & Mbagwu, I (2016). Impact of Information and Communication Technologies in Contemporary Libraries: Case Study of Imo State Public Library Board Owerri. *International Journal of Applied Technologies in Library and Information Management* 2 (1) 1-01 - 015
- Taufiq, M., Rehman, S. U., & Ashiq, M. (2020). User satisfaction with resources and services of public libraries of Lahore, Pakistan. *Library Philosophy and Practice (e-journal)*. <https://digitalcommons.unl.edu/libphilprac/4347>
- Wada, I., Madu, A., Ibrahim, L. F., & Shehu, A. (2024). Librarians' ICT Proficiency and Awareness of Artificial Intelligence for Information Resources Management in Nigerian Libraries. *Journal of Library and Information Management, Technology, Education*, 1(1), 15-31.

