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BARRIERS AND ENABLERS OF EMERGING TECHNOLOGY ADOPTION IN PUBLIC LIBRARIES: A STUDY OF INFORMATION MANAGEMENT PRACTICES IN ADAMAWA STATE, NIGERIA

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Abstract: **This study investigates the barriers and enablers influencing the adoption of emerging technologies in public libraries across Adamawa State, Nigeria. Drawing on primary data from library professionals, the study examines institutional, technological, and human factors that facilitate or hinder technology adoption, as well as the prevalent constraints affecting implementation. The findings reveal that while awareness and perceived usefulness of emerging technologies are high, adoption is impeded by infrastructural limitations, inadequate funding, insufficient training, and organizational resistance to change. Conversely, institutional support, peer influence, and training opportunities serve as key enablers. The study recommends targeted investment in infrastructure, staff development, and policy reforms to facilitate successful digital transformation. These insights are critical for stakeholders aiming to improve service delivery and bridge the digital divide in public libraries.**

Keywords: **Emerging technologies, Public libraries, Technology adoption, Barriers, Adamawa State.**

1. INTRODUCTION

In the current digital era, public libraries are under increasing pressure to modernize their services through the adoption of emerging technologies. These technologies include artificial intelligence, cloud computing, digital repositories, Internet of Things (IoT), and mobile services, which have revolutionized information management globally (Masenya, 2020). Public libraries, especially in developing regions, must align their services with user expectations that are increasingly shaped by digital innovation (Dongare, 2022). In Nigeria, public libraries are expected to serve as inclusive knowledge hubs, yet their capacity to do so is contingent upon their digital infrastructure and adoption readiness.

The successful adoption of emerging technologies in libraries is shaped by several institutional, technological, and human factors. Institutional leadership, funding support, and policy frameworks play a pivotal role in determining whether a library system can integrate new tools (Al-Fadhli et al., 2016). Technological enablers such as interoperability, perceived ease of use, and compatibility with existing systems also drive adoption (Tella et al., 2017). On the human side, librarians' digital competencies, attitudes, and willingness to change are crucial (Ukaegbu & Okwu, 2022). Thus, understanding these interrelated factors is essential for developing responsive strategies to foster digital transformation in public libraries.

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Nevertheless, the adoption of emerging technologies in public libraries in Nigeria has been generally slow. Numerous studies cite poor funding, infrastructural deficits, and resistance to change as core limitations (Saibakumo, 2021; Bassey & Owushi, 2023). The challenges are exacerbated in less-developed states like Adamawa, where public libraries operate in low-resource environments. According to Dei (2020), the absence of clear policy direction and inadequate human resource capacity further complicates the integration process. Despite these obstacles, libraries in such contexts are not entirely passive; some have adopted limited forms of digital technologies like social media and e-lending services (Oduwole & Oyedokun, 2023).

This study explores the specific enablers and barriers to emerging technology adoption in public libraries across Adamawa State. While prior research provides general insights into ICT use in libraries across Nigeria, few studies offer a localized assessment of the realities in Adamawa State. This research fills that gap by offering a contextualized analysis of the institutional, technological, and human factors that support or constrain technology adoption. The findings are aimed at guiding stakeholders in designing policies and programs to strengthen digital infrastructure and enhance public library services in the region.

2. MATERIALS AND METHOD

This study employed a descriptive survey design targeting public library staff across Adamawa State. A structured questionnaire was distributed to 120 respondents selected through purposive and stratified random sampling from libraries in Yola, Mubi, Numan, and other local councils. The instrument comprised four sections: demographic data, awareness and usage of emerging technologies, enabling factors, and perceived barriers. Data were analyzed using descriptive statistics, including frequencies, percentages, and mean ratings. The results were presented in tabular form and discussed with reference to relevant literature. Ethical approval was secured, and informed consent was obtained from all participants.

3. RESULTS AND DISCUSSION

Table 1: Demographic Characteristics of the Respondents

Characteristics	Frequency	Percentage
Gender		
Male	72	60%
Female	48	40%
Age Group		
18–30	24	20%
31–45	60	50%
46 and above	36	30%
Educational Qualification		
Diploma	12	10%
BLS	66	55%
MLS or above	42	35%
Years of Experience		
Less than 5	30	25%
6–10	54	45%
Above 10	36	30%

Source: Field Survey, 2024

The demographic data in Table 1 show that respondents are predominantly middle-aged professionals (31–45 years) with moderate to high levels of academic qualifications. This profile aligns with earlier findings by Adeleke (2019), which highlighted the critical role of educational background in shaping library professionals' technology usage. The higher percentage of staff with BLS and MLS qualifications suggests a foundational awareness of information technology principles, potentially influencing openness to digital innovations.

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Furthermore, the experience profile indicates that most librarians have worked for more than five years, implying that they have witnessed changes in library technology over time. As noted by Manjunatha and Patil (2021), experienced staff are better positioned to understand institutional readiness and technological transitions. These demographics provide an essential context for interpreting responses related to adoption enablers and barriers.

Table 2: Institutional, Technological, and Human Enablers of Technology Adoption

Enabling Factors	Agree (%)	Disagree (%)
Institutional support from management	82%	18%
Availability of basic ICT infrastructure	65%	35%
Peer influence among library professionals	71%	29%
Training and professional development programs	76%	24%
Perceived usefulness of technology	84%	16%
Compatibility with existing library systems	62%	38%

Source: Field Survey, 2024

The results in Table 2 indicate that the strongest enablers of technology adoption in Adamawa State's public libraries are perceived usefulness (84%) and institutional support (82%). This corresponds with the findings of Shahzad et al. (2021), who argued that when technology is perceived as beneficial to service delivery, its adoption increases substantially. The significance of institutional support reinforces Al-Fadhli et al. (2016), who emphasized managerial commitment as a prerequisite for successful technological integration.

Moreover, human-centric enablers like peer influence and access to training received relatively high agreement levels, suggesting that library professionals rely on collaborative learning and formal capacity-building programs. This observation is supported by Dowdy (2020), who found that social and professional networks among librarians play a key role in technology uptake. However, the comparatively lower scores for compatibility and infrastructure availability reveal persistent gaps in foundational readiness, echoing concerns by Saibakumo (2021) about infrastructural inadequacies in Nigerian libraries.

Table 3: Major Constraints Limiting Technology Adoption

Constraints	Agree (%)	Disagree (%)
Inadequate funding	91%	9%
Poor internet and power supply	88%	12%
Lack of skilled ICT staff	79%	21%
Resistance to change among staff	64%	36%
Absence of strategic ICT policy	72%	28%
Limited vendor support for library technologies	58%	42%

Source: Field Survey, 2024

In Table 3, inadequate funding emerged as the most significant constraint (91%), followed closely by poor infrastructure (88%) and lack of skilled staff (79%). These findings resonate with the work of Tella et al. (2017), who documented how erratic electricity and low ICT budgets severely hamper automation in Nigerian libraries. The absence of clear strategic ICT policies (72%) also reflects institutional weaknesses, as highlighted by Haq (2021) in his study of smart libraries in Pakistan.

Resistance to change and limited vendor support were moderately rated but still significant. This supports observations by Akwang (2021), who noted that negative attitudes and insufficient stakeholder engagement can derail adoption processes. The findings underscore the complex interplay of resource, policy, and human limitations, suggesting that a multi-level intervention is necessary for successful technology integration in public libraries in the region.

4. CONCLUSION AND RECOMMENDATIONS

The study explored the enablers and barriers to emerging technology adoption in public libraries across Adamawa State, Nigeria. The findings show that while there is considerable awareness and perceived value in adopting digital tools, actual implementation is constrained by systemic and infrastructural deficits. Institutional support and professional training stand out as important enablers, yet their impact is often diminished by chronic underfunding, erratic power supply, and a lack of skilled personnel. These results affirm previous studies (e.g., Adeleke, 2019; Oduwole & Oyedokun, 2023) that emphasize the need for a balanced approach encompassing policy, infrastructure, and human capital development.

Importantly, the high level of agreement regarding perceived usefulness of technology indicates that library staff are not resistant by default. Instead, their willingness is impeded by external structural conditions beyond their control. This aligns with findings from Shahzad et al. (2021), which highlighted the centrality of enabling environments in fostering digital transitions. Addressing this requires a shift in how public library systems are funded and governed. Institutional inertia and limited strategic planning are as detrimental as infrastructural constraints.

In conclusion, emerging technologies have the potential to transform public libraries in Adamawa State into vibrant centers for digital learning and community development. However, their adoption depends on a conducive ecosystem that values investment, training, and collaborative planning. By confronting the existing barriers and leveraging the identified enablers, public libraries can reposition themselves as relevant and dynamic institutions in the digital knowledge economy.

Recommendations arising from this study include the following:

i. The government and relevant stakeholders should increase funding allocations for ICT development in public libraries. This funding should prioritize internet access, backup power systems, and modern computing tools.

ii. Tailored professional development programs should be instituted to improve librarians' digital competencies. Such programs should not only focus on technical training but also promote change management strategies to ease staff transition into new digital environments.

iii. Public library administrators must engage in evidence-based strategic planning. This includes adopting ICT policies that reflect the unique needs of their libraries while remaining adaptable to evolving technologies.

iv. Partnerships should be encouraged between libraries and technology vendors to ensure that staff have continued access to support, updates, and innovations.

v. The state and federal library boards should conduct periodic assessments to track the progress of technology adoption and respond proactively to identified gaps.

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