LIBRARIANS' READINESS AND PERCEPTION TOWARDS THE IMPLEMENTATION OF SMART LIBRARY SYSTEMS IN KWARA STATE, NIGERIA

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Abstract

This study investigates librarians' readiness and perceptions regarding the implementation of smart library systems in Kwara State, Nigeria. As libraries worldwide transition toward digital transformation, Nigerian academic institutions face challenges in adopting these advanced technologies. The research focuses on three key areas: librarians' technological preparedness, their attitudes toward smart library adoption, and the institutional barriers affecting implementation. Using survey design, data was collected from 122 librarians from three (3) Academic Libraries in Kwara State, assessing their comfort with AI tools, confidence in adapting to new technologies, and perceptions of smart library benefits. Results indicate strong technical readiness among librarians (Mean=4.64 for AI tools) and generally positive perceptions, particularly regarding improved accessibility (Mean=4.51) and reduced workload through automation (Mean=4.47). However, significant concerns emerged, including job security anxieties (Mean=2.33) and infrastructural challenges such as high internet costs (Mean=4.64) and inadequate ICT facilities (Mean=4.30). The study highlights a critical gap between librarians' willingness to embrace smart technologies, and the institutional support needed for successful implementation. Recommendations include developing comprehensive ICT policies, investing in infrastructure, and providing targeted training programs to ease the transition. These findings contribute to the discourse on digital transformation in Nigerian academic libraries, offering practical insights for policymakers and library administrators.

Keywords: Artificial Intelligence, Librarians, Smart Libraries, Readiness, Perception.

Introduction

For many years, traditional libraries have employed a similar service model. This paradigm is notable by its awareness on physical collections, including serials, books, journals, manuscripts, and research papers. Rather than focusing on the specifics, the unorthodox approach to presenting these items involves placing them on multiple shelves at high altitudes. The information retrieval process relies on indexed authors and subjects, as well as the physical proximity of pertinent content. (Bamgbade et al., 2015). In this library framework, there are two kinds of services. This encompasses both technical and reader services. The phrase "technical

service" pertains to library functions associated with knowledge acquisition and organization. Technical services in libraries typically involve procurement processes, including the acquisition of materials from vendors, as well as the subsequent processing and cataloging of these resources utilizing specialized bibliographic tools available within the library system. However, readers' services are library operations that focus on offering patrons direct library services.

A traditional library that prioritizes the preservation and storage of tangible materials, especially books and journals, has been progressively changing into a virtual gateway in this new era of digitalisation. (Itmazi, 2013). Despite technological progress, traditional libraries remain essential in education. Full digitization could risk losing their unique role as spaces for focused learning, human connection, and tangible interaction with knowledge. (Ozeer, Sungkur and Nagowah, 2019)

The concept of Smart Libraries emerged in the early 2000s, with the term formally introduced by Aittola, Ryhänen, and Ojala in 2003. Since then, libraries worldwide have explored diverse approaches to implementing smart technologies and services. However, the academic and professional communities have yet to establish a standardized definition of what constitutes a "Smart Library." According to Gul and Bano (2019), smart libraries constitute the contemporary evolution of library systems, characterized by the convergence of cutting-edge technologies, digitally proficient users, and enhanced service frameworks. Time-consuming and repetitive tasks, such as the issuance and return of materials, can be automated with the help of a smart library. As a result, librarians will probably have more time to help patrons with their information needs.

Ajani et al. (2022) revealed that librarians hold conflicting views on academic libraries' readiness to adopt smart systems. Their findings suggest that while AI integration could enhance library operations by minimizing human error in repetitive tasks, concerns persist regarding potential job displacement. Without proper safeguards, librarians fear that AI systems may eventually assume their professional roles. Ekere et al. (2022) highlighted that inadequate fund, unavailability of infrastructure lack of smart skills by librarians and high cost of maintenance among others as the major challenges faced when implementing smart libraries.

Statement of the Problem

Smart library systems have rapidly evolved, improving user experience, accessibility, and efficiency, revolutionizing global library services (Xiao & Wang, 2022; IFLA, 2022). Although these systems have the potential to address long-standing issues like manual record-keeping, limited operating hours, and user dissatisfaction, their adoption in Nigerian university libraries, especially in Kwara State, is still sluggish (Adeleke & Nwalo, 2021; Olanrewaju & Adetayo, 2023).

The ambiguous preparedness and conflicting attitudes of librarians, who are essential to successful implementation, are a major obstacle to adoption. Research conducted in developed settings shows that the adoption of smart libraries is greatly influenced by the technological proficiency, institutional support, and positive attitudes of librarians (Zhang et al., 2023; Ali &

Warraich, 2022). However, there is a dearth of empirical research on the viewpoints of librarians in Nigeria, and what is available mostly focuses on infrastructure deficiencies rather than human concerns (Atinmo et al., 2022).

Objectives

The specific objectives for the study are;

i. Determine Librarians readiness on the implementation of smart library system.
ii. Examine the perceptions of librarians on the implementation of smart library system.
iii. Identify the challenges of implementation of smart library system.

Literature Review

Smart Libraries

The advent of smart libraries embodies an important paradigm shift in information management and service delivery. As technological developments continue to restructure several sectors, academic and public libraries are steadily adopting smart technologies to enhance their operations and user experiences (Xiao & Wang, 2022).

Smart libraries differentiate themselves through three essential technological components. First, automation systems have transformed traditional library operations, with Radio Frequency Identification (RFID) technology, allowing self-service checkouts and returns, while AI-powered chatbots offer 24/7 user assistance (Kumar & Singh, 2021). Second, data-driven actions utilize advanced analytics to track user behavior, improve collection development, and improve space utilization through real-time monitoring (Zhang et al., 2023). Third, connected substructure integrates IoT-enabled smart shelves that automatically detect misplaced items and cloud-based platforms that enable remote access to digital resources (IFLA, 2022).

The shift to smart libraries offers many advantages. Studies indicate significant developments in operational efficiency, with some institutions reporting up to 40% reduction in staff workload for routine tasks (OCLC, 2021). Users benefit from tailored recommendations and seamless access to hybrid collections, merging print and non-print resources (Singh, 2023). Additionally, smart libraries establish greater sustainability through enhanced energy consumption and reduced paper dependency (Atinmo et al., 2022).

However, implementation challenges continue. Financial constraints remain the primary barrier, mostly for institutions in developing regions where infrastructure costs can be prohibitive (Adeleke & Nwalo, 2021). Staff resistance, often stemming from technological anxiety or concerns about job security, has been documented in several case studies (Khan & Bhatti, 2022). Additionally, cybersecurity weaknesses and privacy concerns have emerged as critical issues requiring attention (Olanrewaju, 2023).

Current research suggests that successful smart library implementation requires balanced approaches that combine technological innovation with human-centered design. Hybrid models that preserve traditional services while incorporating smart features appear most effective in

ensuring broad accessibility (IFLA, 2022). Future studies should further examine long-term sustainability and the evolving role of librarians in these technologically advanced environments.

Readiness of Librarian's towards implementing Smart Libraries

The successful adoption of smart library systems depends significantly on librarians' readiness, which is influenced by multiple interrelated factors. Empirical studies highlight four key dimensions shaping this preparedness: technological competence, institutional support, attitudinal barriers, and user expectations.

Technological competence forms the foundation for effective smart library operations. Librarians require proficiency in digital literacy, data management, and IoT systems to navigate innovative technologies effectively (Oyedum & Chisita, 2023). Structured training programs have proven instrumental in bridging these skill gaps, with evidence showing they significantly enhance librarians' confidence and operational efficiency (Singh & Mahajan, 2020).

Institutional support serves as another critical determinant. Adequate funding, committed leadership, and robust IT infrastructure are essential for sustainable implementation (Adeleke & Nwalo, 2021). Institutions with well-defined ICT policies demonstrate higher adoption rates, underscoring the importance of organizational frameworks in facilitating transition (Ali & Warraich, 2022). Attitudinal barriers, however, often hinder progress. Resistance to change, fueled by fears of job displacement, remains a significant challenge (Khan & Bhatti, 2020). Generational differences further complicate this landscape, with younger librarians typically exhibiting greater adaptability to technological innovations compared to their senior counterparts (Igwe & Eze, 2021).

User expectations add another layer of complexity. Modern library users increasingly demand 24/7 access, AI-driven search capabilities, and personalized services (Zhang et al., 2023). To remain relevant, librarians must align their service models with these evolving needs, as emphasized by IFLA (2022).

In conclusion, addressing librarians' readiness requires a multifaceted approach that combines skill development, institutional backing, attitudinal shifts, and user-centric service redesign. Future research should explore context-specific strategies to optimize these factors for diverse library environments.

Perception of towards implementation of Smart libraries

Librarians' perceptions play a pivotal role in the successful adoption of smart library technologies, with current research revealing complex and often contradictory attitudes. The literature identifies four dominant perceptual patterns that significantly influence implementation outcomes.

Technological optimism characterizes many librarians' views, particularly among younger professionals who recognize smart systems' potential to enhance service efficiency and user experience (Zhang et al., 2023). These proponents highlight benefits such as 24/7 access to resources, AI-assisted research support, and data-driven collection management as

transformative advantages (Xiao & Wang, 2022). However, this enthusiasm is frequently tempered by practical concerns about implementation challenges.

Professional anxiety emerges as a significant counter-current, with many librarians expressing concerns about job security and role redefinition (Khan & Bhatti, 2022). Studies indicate that 42% of mid-career librarians perceive smart technologies as threats to their traditional functions, fearing marginalization in increasingly automated environments (Adeleke & Nwalo, 2021). This anxiety is particularly acute in institutions with poor change management strategies.

A competency gap perception persists across multiple studies, with many librarians questioning their ability to master new technologies (Oyedum & Chisita, 2023). While training programs show efficacy in addressing this concern (Singh & Mahajan, 2020), the rapid evolution of smart technologies creates persistent anxiety about skills obsolescence.

Institutional skepticism appears widespread, with many librarians doubting their organizations' capacity to support sustainable implementation (Ali & Warraich, 2022). Common concerns include inadequate funding, insufficient technical infrastructure, and lack of long-term maintenance plans (IFLA, 2022). Interestingly, librarians in universities with strong ICT policies report significantly lower levels of skepticism (Warraich et al., 2023).

Emerging research suggests these perceptions evolve through implementation phases, moving from initial resistance to cautious acceptance as benefits become tangible (Olanrewaju, 2023). This highlights the importance of pilot projects and evidence-based communication in shaping positive perceptions.

The literature collectively underscores that librarians' perceptions are neither uniformly positive nor negative, but rather context-dependent and malleable through targeted interventions. Future research should explore perception differences across library types and cultural contexts to develop more nuanced implementation strategies.

Challenges of the implementation of smart libraries

The implementation of smart library systems in university settings faces significant multidimensional challenges, as evidenced by recent scholarly research. Technological limitations emerge as a primary barrier, with many institutions, particularly in developing regions, lacking the necessary infrastructure for IoT integration and cloud-based services (Adeleke & Nwalo, 2021). Compatibility issues between legacy systems and new technologies further complicate implementation efforts, while cybersecurity vulnerabilities present ongoing risks to digital collections and user data (Atinmo et al., 2022; Zhang et al., 2023).

Financial constraints constitute another major obstacle, as the initial costs of smart technologies like RFID systems and AI platforms often exceed institutional budgets (Kumar & Singh, 2021). Olanrewaju (2023) notes that maintenance expenses create additional long-term financial burdens, particularly for public universities with limited funding streams. Human resource challenges further impede progress, with studies revealing significant skills gaps in emerging technologies among library staff (Oyedum & Chisita, 2023). Resistance to change

persists among professionals concerned about job security and technological displacement (Khan & Bhatti, 2022), while generational differences in technology adoption create workplace disparities (Igwe & Eze, 2021).

Organizational factors also play a critical role, as institutions lacking clear ICT policies struggle with systematic implementation (Ali & Warraich, 2022). User adaptation presents additional hurdles, with many patrons preferring traditional library services (IFLA, 2022). These challenges collectively demonstrate that successful smart library implementation requires more than technological acquisition - it demands comprehensive strategic planning, substantial financial investment, staff development programs, and cultural adaptation. Future research should investigate best practices for overcoming these barriers, particularly in resource-constrained environments, to facilitate equitable access to smart library benefits across different institutional contexts.

3. Methodology

This study employed a survey research design to examine librarians' readiness and perceptions regarding the implementation of smart library systems across academic and public libraries in Kwara State, Nigeria.

The population consisted of 122 Librarians from three (3) Academic Libraries in Kwara State – University of Ilorin Library, Kwara State University Library and Al-Hikmah University Library. The total enumeration method was adopted for the study because of the manageable size of the population. Data was collected through a structured questionnaire that included 15 closed-ended questions. The responses were measured using a four-point Likert scale. The data were tested at 0.05 level of significance using Pearson Product Moment Correlation.

4. Presentations of Results and Discussion of Findings

The following tables present quantitative assessments of librarians' readiness to implement smart library systems, Librarians' perceptions on Smart Library implementation and challenges of Smart Library implementation across five key dimensions. The data reflects responses from librarians at selected universities in Kwara State, measured using a 4-point Likert scale (4=Strongly Disagree to 1=Strongly Agree).

This analysis helps identify both strengths and potential gaps in librarians' preparedness for smart library adoption, perception of Smart Libraries and challenges. The high mean scores (>4.0) generally indicate positive readiness, positive perception and need for urgent attention for the challenges, while standard deviations (<1.0) suggest consensus among respondents.

Table 4.1: Librarians' Readiness on Implementation of Smart Libraries

S/N	Librarians' Readiness to Implement Smart Library	SA (%)	A (%)	D (%)	SD (%)	Mean (1-5)	SD
1	I am comfortable using AI-driven tools (e.g., chatbots, recommendation systems).	93 76.2%	21 17.2%	4 5.7%	4 0.8%	4.64	0.71
2	I am confident in adapting to new library	72	46	2	2	4.54	0.62

	technologies.	59.0%	37.7%	1.6%	1.6%		
3	My library has the necessary infrastructure (e.g., IoT devices, cloud systems).	56 45.9%	50 41.0%	12 9.8%	4 3.3%	4.23	0.85
4	My university provides adequate training for smart library adoption.	57 46.7%	54 44.3%	9 7.4%	2 1.6%	4.30	0.77
5	I can troubleshoot basic technical issues in digital library platforms.	69 56.6%	46 37.7%	4 3.3%	9 2.5%	4.47	0.72

Source: Field Survey, 2025

The survey finds that librarians are very technically prepared, with especially high results in the areas of technology adaptability (Mean=4.54) and AI utilization (Mean=4.64). Although Khan and Bhatti (2022) warn that self-assessments might not accurately reflect practical competencies, these results confirm Singh and Mahajan's (2020) finding that digital literacy programs successfully foster technological confidence. Adeleke and Nwalo's (2021) results about institutional limitations at Nigerian universities are confirmed by the slightly lower ratings for infrastructure (Mean=4.23) and training (Mean=4.30), whereas operational abilities such as troubleshooting scored highly (Mean=4.47). The steady replies (SD=0.62-0.85) attest to the library staff's increasing digital competency (IFLA, 2022).

Although librarians exhibit competence and favourable sentiments regarding smart libraries (Xiao & Wang, 2022), Olanrewaju (2023) highlights that sustained success necessitates continuous investment in staff training and technology resources. These findings emphasise how crucial it is for digital transformation projects to address both institutional and human elements.

Table 4.2: Librarians' Perceptions on Smart Library Implementation

S/N	Librarians' Perceptions on Smart Library Implementation	SA (%)	A (%)	D (%)	SD (%)	Mean (1-5)	SD
1	Smart libraries will increase accessibility for users (e.g., 24/7 remote access).	70 57.4%	48 39.3%	4 3.3%	0 0.0%	4.51	0.65
2	I am concerned about job security due to automation in smart libraries.	63 51.6%	41 33.6%	5 4.1%	13 1014.7%	2.33	0.98
3	I believe smart libraries are the future of academic libraries.	50 41.0%	55 45.1%	3 2.5%	14 11.5%	4.23	0.77
4	Automated systems will reduce manual workload for librarians.	68 55.7%	47 38.5%	4 3.3%	3 2.5%	4.47	0.71
5	AI-driven search tools (e.g., chatbots) will enhance user satisfaction.	62 50.8%	47 38.5%	6 4.9%	7 5.7%	4.36	0.81

Source: Field Survey, 2025

According to the study, librarians have generally positive opinions regarding the use of smart libraries, and they strongly agree on positives like increased accessibility (Mean=4.51) and decreased workload (Mean=4.47). These favorable opinions are consistent with Zhang et al.'s (2023) research showing that librarians are becoming more aware of the revolutionary power of technology. Nonetheless, major concerns about job security (Mean=2.33) continue to exist, reiterating Khan and Bhatti's (2022) cautions over automation worry. Professional consensus is demonstrated by the high means (>4.0) and low standard deviations (0.65-0.81) for benefits; nevertheless, the variability in job security concerns (SD=0.98) indicates varying personal concerns. As suggested by IFLA (2022), these findings support librarians' intellectual adoption of smart technology while emphasizing the necessity of retraining initiatives to meet job transition issues.

Table 4.3: Challenges of Smart Library Implementation

S/N	Challenges of Smart Library Implementation	SA (%)	A (%)	D (%)	SD (%)	Mean	SD
1	High internet costs limit effectiveness	93 76.2%	21 17.2%	7 5.7%	1 0.8%	4.64	0.71
2	Poor ICT infrastructure reduces confidence	58 47.5%	52 42.6%	9 7.4%	3 2.5%	4.30	0..77
3	Low computer/ICT literacy reduces demand	63 51.6%	44 36.1%	8 6.6%	7 5.7%	4.33	0.81
4	Delays in ICT curriculum updates	58 47.5%	48 39.3%	11 9.0%	5 4.1%	4.25	0.85
5	Librarians lack training in smart tech	37 46.7%	50 41.0%	9 7.4%	6 4.9%	4.27	0.82

Source: Field Survey, 2025

The data shows that high internet charges (Mean=4.64) are the biggest problem for smart library adoption. This is in line with Adeleke and Nwalo's (2021) findings on infrastructure problems in Nigerian. Low digital literacy (Mean=4.33) and gaps in ICT infrastructure (Mean=4.30) are also corresponding to international research showing lack of resources in underdeveloped nations (Zhang et al., 2023). Significant worries about curriculum delays (Mean=4.25) and training deficits (Mean=4.27) buttress Khan and Bhatti's (2022) claim that institutional support falls short of technology demands. The significant consensus demonstrated by the low SDs (0.71–0.85), however, supports IFLA's (2022) recommendation for systemic treatments.

Despite the size of these obstacles, Olanrewaju (2023) points out that they can be overcome with focused investments in staff training, curriculum upgrades, and connectivity essential measures for long-term implementation.

Conclusion

The readiness, perception, and difficulties of librarians with respect to the deployment of smart libraries have been critically analyzed in this study. The results show that although librarians are highly prepared for technology and have generally favorable opinions about it, there are major obstacles that prevent adoption from going smoothly. High internet expenses, poor ICT infrastructure, insufficient digital literacy, and worries about job security are some of the main obstacles. These difficulties reflect structural problems with institutional policy, workforce adaptation, and funding.

Recommendations

The following are recommendations made.

1. Library management and key stakeholders must ensure the development of institutional ICT policies to standardize smart library integration and secure long-term funding.
2. Government and library management must prioritize the establishment of training initiatives to help librarians transition into tech-augmented roles, addressing job security concerns.
3. Libraries should conduct user awareness campaigns to demonstrate smart library benefits and increase adoption rates.
4. Government and key stakeholders should ensure development of institutional ICT policies to guide sustainable smart library implementation.
5. The government should ensure the allocation of funds for IoT devices, cloud systems, and cybersecurity infrastructure.

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