LAFIA JOURNAL OF LIBRARY AND INFORMATION SCIENCE
Volume 7, Number 1, 2025.
Available online: https://journals.fulafia.edu.ng/index.php/ljlis
ISSN: Print - 2814-0702, Online - 2814-0710
LJLIS

APPLICATION AND CHALLENGES OF MOBILE TECHNOLOGIES IN ENHANCING CURRENT AWARENESS AND SELECTIVE DISSEMINATION OF INFORMATION SERVICES IN UNIVERSITY LIBRARIES IN NORTH CENTRAL NIGERIA

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Abstract
The rapid evolution of mobile technologies has revolutionized service delivery in various sectors, including higher education and library management. University libraries, as essential information hubs, have the potential to enhance their services through the integration of these technologies. However, the extent to which mobile technologies are utilized in university libraries in resource-constrained regions, such as North Central Nigeria, remains unclear. This study explored the application and challenges of mobile technologies for enhancing current awareness services, selective dissemination of information (SDI), and overall library service delivery in Federal University libraries in North Central Nigeria. Using a survey design, the study population of 212 librarians, with data collected through a structured questionnaire. The data were analyzed using Mean, Standard Deviation, and Chi-Square Goodness of Fit to test hypotheses. The findings revealed that the application of mobile technologies in service delivery was generally low, with mobile technologies primarily used for notifying users about new materials via SMS, MMS, and email. Challenges identified included inadequate infrastructure, lack of technical skills, insufficient training, and financial constraints. The study concluded that there is a need for significant improvements in mobile technology integration in university libraries in the region. Recommendations include enhancing infrastructure, providing regular staff training, and developing comprehensive mobile technology strategies to improve service delivery in these libraries.

Keywords: Mobile Technology, Service Delivery, Current Awareness Service and Selective Dissemination of Information Service

Introduction

In the rapidly evolving information age, mobile technologies have emerged as transformative tools for improving service delivery across various sectors, including libraries. University libraries, in particular, have increasingly turned to mobile technologies to enhance their information services, ensuring that users have access to relevant, timely, and accurate resources in an increasingly digital world (Garg, 2017). As information-seeking behavior changes and technology advances, libraries must explore innovative ways to deliver services that meet the needs of their diverse academic communities (Ajayi and Tijani, 2020). In the context of university libraries in North Central Nigeria, mobile technologies offer new opportunities for enhancing two critical services: Current Awareness Services (CAS) and Selective Dissemination of Information (SDI). These services are fundamental to supporting the academic and research activities of students, faculty, and researchers. However, the adoption and integration of mobile technologies into these services are not without challenges. Libraries in North Central Nigeria face unique challenges, including limited funding, inadequate infrastructure, and a lack of technical skills among staff (Olowu and Afolabi, 2019).

Current Awareness Services (CAS) and Selective Dissemination of Information (SDI) are essential components of library services that ensure the timely dissemination of relevant and updated information to users (Cheng, 2018). CAS involves informing users about new resources or developments in their fields of interest, while SDI tailors information delivery based on individual user profiles or needs. Both services aim to help users stay current with new publications, research, and trends that are critical to their academic work. Traditionally, these services have been offered through print media, newsletters, or bulletin boards. However, with the advent of mobile technologies, university libraries can now offer more dynamic and immediate channels of communication, allowing users to receive information on-the-go, thus increasing the effectiveness of these services (Ajayi and Tijani, 2020; Smith, 2019). Mobile phones, smartphones, and tablets are becoming ubiquitous, and as such, their integration into library services is seen as an efficient means to reach the tech-savvy academic community.

The application of mobile technologies in university libraries across the globe has been studied extensively, but in the Nigerian context, particularly in the North Central region, research on this topic remains limited. Nigeria's university libraries face unique challenges in service delivery, such as limited funding, poor infrastructure, and a lack of sufficient technical skills among staff (Olowu and Afolabi, 2019). However, despite these obstacles, there has been an increasing

recognition of the potential of mobile technologies to address some of these challenges, particularly in enhancing communication, access to resources, and overall user engagement. North Central Nigeria, which includes states like Abuja, Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau, has witnessed a steady rise in mobile phone penetration, making mobile technologies a viable option for library service delivery (Ayo and Raji, 2020). Therefore, understanding how mobile technologies are applied to CAS and SDI in this region is critical to improving the effectiveness and reach of university libraries in these areas.

Statement of the Problem

Despite the growing penetration of mobile technologies and their transformative potential in enhancing library service delivery globally, university libraries in North Central Nigeria continue to struggle with effectively integrating these tools into key services such as Current Awareness Services (CAS) and Selective Dissemination of Information (SDI). While mobile devices offer promising avenues for timely, personalized, and user-centered information dissemination, their actual application in this region remains limited and inconsistent. This gap is largely attributed to infrastructural deficits, lack of staff training, inadequate funding, and limited user engagement strategies. Consequently, many academic library users in the region are deprived of the full benefits of modern information services, necessitating a study to investigate the current state, challenges, and potential for mobile technology adoption in these essential library functions.

Objectives of the Study

Specifically, the study sought to achieve the following objectives:

- Determine how mobile technologies are applied in current awareness service delivery in university libraries in North Central Nigeria
- Ascertain the application of mobile technologies in Selective Dissemination of Information (SDI) service delivery in university libraries in North Central Nigeria
- Determine the challenges faced in the application of mobile technologies for service delivery in university libraries in North Central Nigeria

Research Questions

The following research questions guided the study:

- How are mobile technologies applied in current awareness service delivery in university libraries in North Central Nigeria?

- What is the level applicability of mobile technologies in Selective Dissemination of Information (SDI) service delivery in university libraries in North Central Nigeria?
- What are the challenges hindering the application of mobile technologies for effective library service delivery in university libraries in North Central Nigeria?

Statement of Hypotheses

The following null hypotheses were formulated and tested at 0.05level of significance:

- The application of mobile technologies for current awareness service delivery in university libraries in North Central Nigeria is not significantly high
- The application of mobile technologies for Selective Dissemination of Information (SDI) service delivery in university libraries in North Central Nigeria is not significantly high

Theoretical Framework

The Technology Acceptance Model (TAM) is one of the most relevant theories that align with this study. The TAM, proposed by Davis (1989), is centered on understanding the factors that influence users' acceptance of technology. According to the model, perceived ease of use and perceived usefulness are the primary determinants of technology acceptance. In the context of university libraries in North Central Nigeria, the TAM can help explain the extent to which library users (students, faculty, and researchers) are likely to embrace mobile technologies for information services. If users perceive that mobile technology applications are easy to use and can enhance their academic experience—by providing them with timely, personalized, and accessible information—then they are more likely to adopt these technologies. The application of TAM can provide insights into factors such as mobile app interfaces, ease of access, and content relevance, which are crucial for improving CAS and SDI services. Understanding the perceptions of library users regarding mobile technology can guide libraries in tailoring their services to ensure maximum user engagement and adoption, thereby improving service delivery. The use of mobile platforms in university libraries hinges not only on their technical functionality but also on users' acceptance, making TAM an essential framework to explore in this study.

Research Methodology

This study employed a survey research design and was conducted in North

Central Nigeria. The target population for the study consisted of 212 librarians working in Federal Universities within this region. These universities include: Federal University Lafia, Nasarawa State, University of Abuja, Joseph Sarwuan Tarka University, Makurdi Benue State, Federal University of Health Science, Otukpo, Benue State, University of Ilorin, Kwara State, Federal University of Technology Minna, Niger State, University of Jos, Plateau State and Federal University Lokoja, Kogi State. The entire population of 212 librarians was included in the study. Data were collected using a structured questionnaire titled "Mobile Technologies, Challenges, and Library Service Delivery Questionnaire (MTCLSDQ)." To ensure the validity of the instrument, it underwent both face and content validation by three experts—two from the field of Library and Information Science and one from Measurement and Evaluation at the University of Calabar. Additionally, the instrument was pre-tested on a sample of 30 librarians from Nnandi Azikiwe University, Awka. The data gathered during the pre-test were analyzed using the Cronbach Alpha method to assess the reliability of the instrument, resulting in reliability coefficients of .79, .80, and .81 for the three sections of the questionnaire. The researcher, assisted by seven research assistants, collected the data for the study. Once collected, the data were coded and analyzed using Mean and Standard Deviation to address the research questions. To test the hypotheses, the Chi-Square Goodness of Fit was employed at a significance level of 0.05. For the Chi-square test, the decision rule was based on the P-values and Alpha values: if $P < .05$, the null hypothesis was rejected and considered to have a "Significant Influence," while if $P > .05$, the null hypothesis was not rejected, indicating "No Significant Influence."

Results

Research Question 1: How are mobile technologies applied in current awareness service delivery in university libraries in North Central Nigeria?

Table 1: Mean and Standard Deviation Analysis of Responses on how Mobile Technologies Applied for Current Awareness Service Delivery in University Libraries in North Central Nigeria

S/N	Mobile techno logies such as laptops, PDAs, smarts phones and tablets are used in the current awareness service in my library in the following areas:	Mean	SD	Decision
1	Facilitating the delivery of information to users on list of on-going and anticipated seminars, conf erences and workshops	2.31	.79	Disagree
2	Facilitating the delivery of current contents of information resources	2.36	.80	Disagree
3	Facilitating routing of periodicals to users	2.29	.81	Disagree
4	Facilitating the list of the bibliographic records	2.30	.83	Disagree
5	Disseminating bulletins	2.40	.84	Disagree
6	Integrating current awareness services with social media platforms	2.41	.84	Disagree
7	Designing and displaying newly acquired materials and using notice boards	2.35	.80	Disagree
8	Passing materials to individuals to pass in turn to others on a circulation list	2.32	.87	Disagree
9	Providing notice to users on new materials through SMS, MMS and e-mails	2.57	.80	Agree

The results presented in Table 1 indicate that mobile technologies are generally not widely applied in the delivery of Current Awareness Services (CAS) in university libraries in North Central Nigeria. The mean scores for most of the listed areas of service delivery, such as facilitating the delivery of information on seminars, conferences, workshops, and disseminating bulletins, are below the threshold of 3.0, which signifies disagreement. Specifically, the application of mobile technologies in areas like routing periodicals, displaying bibliographic records, or integrating services with social media platforms is met with disagreement, as indicated by the mean scores ranging from 2.29 to 2.41. However, a slight exception is observed in the area of providing notifications to users on new materials through SMS, MMS, and emails, where the mean score of 2.57 suggests that mobile technologies are somewhat applied in this aspect, as it falls within the "agree" range.

Research Question 2: What is the level applicability of mobile technologies in Selective Dissemination of Information (SDI) service delivery in university libraries in North Central Nigeria?

Table 2: Mean and Standard Deviation Analysis of Responses on how Mobile Technologies Applied for Selective Dissemination of Information (SDI) Service Delivery in University Libraries in North Central Nigeria

S/N	Mobile technologies such as laptops, PDAs, smarts phones and tablets are used in the current awareness service in my library in the following areas:	Mean	SD	Decision
1	Facilitating routing of periodicals to users with specific information needs	2.37	.79	Disagree
2	Developing audio and video resources targeted toward very specific audiences.	2.33	.80	Disagree
3	Informing users latest developments in their specific field of users' interest	2.65	.81	Agree
4	Giving a personalized service meant to individuals having identical information needs	2.34	.83	Disagree
5	Receiving, scanning and providing the literature / information to the right users at the right time.	2.43	.84	Disagree
6	Bringing to the notice of the users all the current information which is relevant to their interest	2.64	.84	Agree
7	Saving the time of the user in information retrieval	2.34	.80	Disagree

The results in Table 2 show that mobile technologies are not widely applied in Selective Dissemination of Information (SDI) service delivery in university libraries in North Central Nigeria, as most of the mean scores for the listed areas fall below the threshold of 3.0, indicating disagreement. Specifically, activities such as facilitating the routing of periodicals, developing audio and video resources, providing personalized services, and receiving and distributing literature are generally not implemented using mobile technologies, with mean scores ranging from 2.33 to 2.43. However, there is some positive response regarding informing users about the latest developments in their specific field of interest and bringing relevant information to users' attention, as these areas recorded higher mean scores of 2.65 and 2.64, respectively, suggesting a moderate application of mobile technologies for these SDI services.

Research Question 3: What are the challenges hindering the application of mobile technologies for effective library service delivery in university libraries in North Central Nigeria?

Table 3: Mean and Standard Deviation Analysis of Responses on challenges hindering the application of mobile technologies for effective library service delivery in university libraries in North Central Nigeria

S/N	Challenges	Mean	SD	Decision
1	Lack of information technology skills	2.63	.87	Agree
2	Limited mobile technology strategy and techniques for service delivery in the library (free mobile applications	3.12	.79	Agree
3	Indifferent attitudes of the library management to support mobile technologies application.	3.32	.91	Agree
4	Limited IT professionals (system Librarians) to handle the mobile technology literacy training instruction for information professions in the library	3.00	.89	Agree
5	Insufficient space to house the mobile technologies	2.61	.81	Agree
6	Scarcity of m obile devices to access mobile library service	3.54	.85	Agree
7	Inconsistent power supply	3.63	.90	Agree
8	Lack of proper understanding of mobile library -based technology for service delivery	2.82	.84	Agree
9	Lack of workshops and seminars trainings on how to use the mobile library technology	3.22	.87	Agree
10	Financial constraints	3.18	.91	Agree
11	Poor network infrastructure	3.40	.91	Agree
12	Data subscription issues and high tariff charges	3.66	.84	Agree

Table 3 highlights several challenges that hinder the effective application of mobile technologies for library service delivery in university libraries in North Central Nigeria. The most significant challenges include data subscription issues and high tariff charges (mean = 3.66), inconsistent power supply (mean = 3.63), and poor network infrastructure (mean = 3.40). Other key barriers include the scarcity of mobile devices (mean = 3.54), financial constraints (mean = 3.18), and a lack of trained IT professionals to handle mobile technology literacy (mean = 3.00). Additionally, there are issues such as indifferent attitudes from library management (mean = 3.32), limited mobile technology strategies (mean = 3.12), and insufficient space to house mobile technologies (mean = 2.61). Overall, the results indicate that a combination of financial, technical, and managerial challenges significantly impacts the adoption and effective use of mobile technologies in university libraries in the region.

Hypothesis One: The application of mobile technologies for current awareness service delivery in university libraries in North Central Nigeria is not significantly high

Table 4: Chi-Square Goodness of fit test of the application of mobile technologies in current awareness service delivery in university libraries in North Central

Response Options	Observed N	Expected N	Df		Sig	á - level	Remark
SA	21	53.0					
A	33	53.0					
D	94	53.0					
SD	64	53.0					
Total	212		3	31.983	.097	.05	Not Significant

Df = Degree of Freedom; = Chi-Square Calculated Value; Sig = P-Value, P>0.05

Table 4 shows the Chi-square calculated value of 31.983, degree of freedom (df) =3 and a sig (P-value=.097) which is less than the alpha value (á) of .05. Since P>.05, the result is significant, therefore the null hypothesis is accepted. This implies that, the application of mobile technologies for current awareness service delivery in university libraries in North Central Nigeria is not significantly high.

Hypothesis 2: The application of mobile technologies for SDI service delivery in university libraries in North Central Nigeria is not significantly high

Table 5: Chi-Square Goodness of fit test of the application of mobile technologies in Selective Dissemination of Information service delivery in university libraries in North Central

Response Options	Observed N	Expected N	Df		Sig	á – level	Remark
SA	15	53.0					
A	41	53.0					
D	80	53.0					
SD	76	53.0					
Total	212		3	28.901	.099	.05	Not Significant

Df = Degree of Freedom; = Chi-Square Calculated Value; Sig = P-Value, P>0.05

Table5 shows the Chi-square calculated value of 28.901, degree of freedom (df) =3 and a sig (P-value=.099) which is less than the alpha value (á) of .05. Since P>.05, the result is significant, therefore the null hypothesis is accepted. This implies that, the application of mobile technologies for Selective Dissemination of Information service delivery in university libraries in North Central Nigeria is not significantly high.

Discussion

Based on the findings that emanated from the study, the following were discussed. The study's findings indicated that the utilization of mobile technologies for current awareness service delivery within university libraries in North Central Nigeria is not significantly high. This finding corroborates with that of Omeluzor and Oyovwe-Tinuoye (2017) who found that since the internet and telephones are not consistently used, dissemination of information to the users may be limited to only those who access information via notice boards and memos. The finding disagrees with that of Amuni, Niran and Olatunji (2014) who found that academic libraries have not adopted mobile technology in provision of current awareness services. The finding does not conform to that of Akanbi, Ogunleye, Sulaiman (2020) who found that the libraries rendered current

awareness service (CAS) using some ICT tools like email, Usenet and OPAC and that, CAS was found to be done with the aid of technological tools. The observed findings regarding the limited utilization of mobile technologies for current awareness service delivery in university libraries in North Central Nigeria can be attributed to a combination of factors, including technological accessibility, regional disparities, time-related changes in adoption rates, and variations in research methodologies. These factors collectively contribute to the unique circumstances shaping the practices of these libraries.

The second finding of the study revealed that the application of mobile technologies for Selective Dissemination of Information service delivery in university libraries in North Central Nigeria is not significantly high. This finding is corroborate with that of Omeluzor and Oyovwe-Tinuoye (2017) who found that since the Internet and telephones are not consistently used, dissemination of information to the users may be limited to only those who access information via notice boards and memos. The finding however disagree with that of Amuni, Niran and Olatunji (2014) whose study on mobile technology and information services provision: a perception of library users in selected universities found that academic libraries have not adopted mobile technology in delivery of selective dissemination of information services. The observed findings concerning the limited use of mobile technologies for Selective Dissemination of Information (SDI) service delivery in university libraries in North Central Nigeria can be attributed to a combination of factors, including technological accessibility, regional disparities, changes in adoption rates over time, and differences in research methodologies. These factors collectively shape the current practices and utilization of mobile technologies within the context of SDI in these libraries.

Finally, the findings of the study revealed that a plethora of challenges hinders the application of mobile technologies for effective library service delivery in university libraries in North Central Nigeria. This discovery aligns closely with the research conducted by Hassan, Musa, and Abdullahi (2017), who identified several challenges in the adoption and utilization of mobile technologies for service delivery. These challenges encompass factors such as insufficient comprehension of mobile library technology, limited availability of mobile devices like Personal Digital Assistants (PDAs), Tablets, and e-Readers for accessing mobile library services, a scarcity of IT professionals equipped to provide mobile technology training, and a lack of workshops and seminars focusing on mobile library technology use. Additionally, the absence of comprehensive mobile technology strategies and techniques for service delivery, including free mobile applications, was noted. These findings also resonate with

the work of Sharma and Madhusudhan (2017), who pointed out various barriers linked to mobile technology use. These encompass issues like inadequate network coverage, high data charging plans, sluggish loading times due to small screen sizes, concerns regarding data security and authenticity of electronic resources, and a dearth of specialized content formats. Similarly, the observations align with the study by Yemi-Peters, Sokari, Olayemi, Abba, and Gama (2019), where challenges associated with mobile-based social media technologies including internet speed, financial limitations, subpar network infrastructure, insufficient electricity supply, and a lack of information literacy skills among users were identified. Furthermore, the findings are in line with the research conducted by Damilola, Okesanya, Abiodun, and Kusoro (2019), who discovered hindrances such as power outages, a multitude of mobile devices requiring learning, inadequate knowledge, slow internet speeds, funding shortages, limited staff and training opportunities, all impacting mobile information services delivery. Likewise, the study resonates with Gama's (2013) findings, which highlighted challenges like inconsistent power supply, insufficient ICT facilities, unreliable internet networks, and users' lack of interest, affecting the adoption of ICT in libraries. Finally, the conclusions drawn here mirror Mustapha, Ibrahim, Garba, and Muhammed's (2012) findings, which identified challenges including staff commitment, technical expertise gaps, poor internet connectivity, training deficiencies, data subscription issues, and high tariff charges, all linked to the adoption of mobile technology in library settings. Altogether, these challenges underscore the need for strategic planning, resource allocation, training opportunities, and infrastructural improvements to overcome the barriers hindering the adoption of mobile technologies in university libraries.

Conclusion

Based on the findings of this study, it can be concluded that the adoption and application of mobile technologies for current awareness and selective dissemination of information services in university libraries in North Central Nigeria are limited, primarily due to several infrastructural, financial, and organizational challenges. Although mobile technologies are somewhat utilized for certain aspects like delivering notifications to users about new materials, their broader use is hindered by factors such as inconsistent power supply, inadequate network infrastructure, scarcity of mobile devices, and lack of technical skills among library staff. Additionally, there is a lack of comprehensive mobile technology strategies, limited training opportunities, and insufficient support from library management.

Recommendations

Based on the findings of the study, the following recommendations are made to enhance the application of mobile technologies for service delivery in university libraries in North Central Nigeria:

- University libraries in North Central Nigeria should invest in improving their technological infrastructure, including ensuring a consistent power supply, providing adequate network coverage, and acquiring sufficient mobile devices for users.
- Library management should prioritize the training of librarians and library staff in mobile technology literacy through regular workshops and seminars.
- Library management should formulate and implement clear strategies for the integration of mobile technologies into library services.

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