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Adoption and Use of Mobile Technologies for Service Delivery in Kashim Ibrahim Library, Ahmadu Bello University (ABU) Zaria, Nigeria

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Abstract

The study was undertaken to determine the adoption and use of mobile technologies for service delivery in Kashim Ibrahim Library, Ahmadu Belo University (ABU) Zaria, Nigeria. Three research objectives and hypotheses were raised and answers to them were sought. Survey research method was adopted for the study and data was collected from a sample of 24 out of the total population of 42 library professionals. The data were analyzed descriptively using frequency count and percentages, and Chi-square was used to test the hypothesis. The study revealed that not all the Mobile technologies available are adopted and use for service delivery, only Library short message service (SMS) notifications was adopted and use for service delivery in Kashim Ibrahim Library. The study recommends that there should be frequent workshops and training of staff to inform them on the current mobile technologies literacy instruction in the library and to enable other Nigeria libraries and the world at large to adopt and use the mobile library technologies for service delivery.

Keyword: Mobile Technologies, Library Services, Mobile Library Services, Mobile Communication

1.1 Introduction

Information and communications technology continues to expand the boundaries of higher education into the 'anytime/anywhere' experiences. Mobile communication is transforming how people search, receive and interact with information on a daily basis. In just a few years ago the *International Telecommunications Union* (ITU) (2011) opined that smart phone ownership has skyrocketed and popular use of e-readers has been steadily on the rise. These advanced mobile technologies provide portable access to the world of information across boundaries of subjects, disciplines and industries. The explosion of advanced mobile technology and robust digital information collection capabilities prompt libraries to use mobile applications and services, educate users in best practices with the use of mobile devices, to connect with patrons, creating a library application (app) or mobile Web site that allows patrons to access library hours view their library account or even search databases easier, creating opportunities to educate users in best practices with respect to privacy issues associated with the use of mobile devices.

1.2 Statement of problem

Libraries all over the world are utilizing the latest information and communication technologies to assist in their objective of providing clients with effective and efficient services, as well as timely access to needed information. Most libraries in the developed countries like the Duke University Library and Columbia Public Library have embraced the use of mobile technologies to service delivery by providing mobile library applications to users. Adoption and the use of mobile technologies for service delivery are trends that have not yet been fully embraced by academic libraries in Nigeria due to some technical and non technical factors. It is in view of this that the researchers set to investigate the adoption and use of mobile technology for service delivery in Kashim Ibrahim Library A.B.U. Zaria, Nigeria

1.3 Research Objectives

The objectives of the study are to:
1. Find out the level of awareness of mobile technologies for service delivery in Kashim Ibrahim Library, A.B.U Zaria Nigeria
2. Determine the extent mobile technologies are adopted and use for service delivery in Kashim Ibrahim Library, A.B.U Zaria, Nigeria.
3. Find out the challenges face in the effective adoption and use of mobile technology for service delivery in Kashim Ibrahim Library, A.B.U Zaria Nigeria

1.4 Research Hypothesis

There is no significant relationship between extent of mobile technology adoption and use and challenges faced by Kashim Ibrahim Library in adopting and using of mobile technologies for service delivery.

1.5 Background Information on Kashim Ibrahim Library

The University Library System of Ahmadu Bello University Zaria comprises the Kashim Ibrahim Library (the main library) that was established in 1962, and eleven other satellite libraries located in different campuses of the University. The Library has a total holding of over 1.2 million volumes of books and 66,000 periodical titles. The University library has always been at the centre of research and scholarship playing a major role in acquiring, processing and lending library materials and responding to patrons' inquiries. With the MacArthur Foundation and the Carnegie Corporation, rapid progress has been made not only in updating the collection, but also in automating the resources and services of the library system. Today, online and CD-ROM searches are a common feature among staff and students of the University. With staff strength of 42 professionals and 109 paraprofessionals; 22 senior and 102 junior non-professional staff in the entire university library system, the library management is striving to upgrade the IT skills of the staff to enable them cope with challenges of the information age. The library comprise of 9 divisions and include resource development, customer service, resource processing, reference and information service, serial management, research and bibliographic service, human resources, media and public relation and information and communication technology divisions (ABU,2016).

2.1 Review of Related Literature

Information and Communication Technology (ICT) has changed the way people access and communicate information. Users want easy and instant access to relevant information. Library and information professionals should think out of box for

meeting the information need of users. Development of mobile technologies has resulted in shifting academic environment from traditional to mobile base. Adoption and use of mobile technology enables academic librarians to rethink and remodel their services to meet the current mobile technology revolution.

The recognition by an increasing number of libraries, information providers, and organizations of the nearly ubiquitous adoption of hand-held devices by students, faculty, and the general public, has led an increasing number to develop a range of mobile-oriented information on services for these communities. Academic libraries need to offer innovative services in order to provide quality service to students and adult learners. For example, various enquiry channels such as telephone, email, and instant messages have been integrated into library services such as reference services to provide better support to learners.

With the immense popularity and adoption mobile technology, it is now being used in many library services including reference services to provide an additional channel of service. For instance, the Southbank Institute of Technology in Australia adopted an SMS reference service. Using Message Net, students can send SMS queries to the service section. The SMS is routed to a common email mailbox and service staff can reply to the user using the email to SMS facility (Vimal and Chitra *2008).*

2.2 Mobile Technologies used in Libraries and Information Centers

Dheera (2014) opined that Libraries provide a wide array of mobile services to interested users: They are:

E-books and e-book readers: E-books, or books in digital form, may be purchased or freely downloaded in formats that will enable individuals to read them on standard computers, or they may be configured in proprietary formats for particular devices. Libraries already offer e-book content that users can download and read on standard computers.

Mobile online public access catalogs (OPACs) and databases: Libraries are providing access to their OPACs and some databases such as Pub Med via mobile-optimized Web sites. The New York Public Library Mobile Beta site supports a mobile OPAC and allows users to browse library locations and hours.

Mobile applications: Some libraries have developed mobile applications for smart phones. The District of Columbia Public Library, for example, has developed an iPhone application that includes a mobile OPAC and the ability to place, and also provides information on hours and locations of local libraries.

Mobile collections: Third-party content providers are partnering with libraries to deliver audio books, e-books, audio language courses, streaming music, films, images and other multimedia that can be used on mobile devices.

The overdrive service: This service is supported on numerous mobile devices and has developed an application for BlackBerry and Android smart phones. Duke University has created a free iPhone application called Duke. Mobile, containing a wealth of information on digital library resources, including extensive access to the library's digital photo archive and other collections.

Mobile library instruction and mobile learning: Many libraries are offering library instructional materials and resources via mobile platforms. For

example, East Carolina University's "Research First Aid" is a series of podcasts for library researchers on the go.

Library short message service (SMS) notifications: Many libraries use SMS for a variety of purposes, including notification for items available for pickup, due date reminders, information on availability of library materials, provision of call numbers and locations and to push information out to many users at the same time, e.g. agricultural commodity prices.

Virtual reference: Some libraries are offering "text-a-librarian" or chat services ideal for simple questions that can be answered with a brief response or through interactivity via Skype or IM

2.3 Factors influences the adoption and use of mobile technology for library services

The factors that could influence the adoption of Mobile technology for library services are technical and non-technical factors. **Tiko,** and *Mtshali, (2011) assert that* the technical factors are mainly technology and its compatibility. While the non-technical factors are primarily human and process related, the stakeholders have different ways of accessing library services. Some of them access the services manually and others prefer to explore the information systems and technology which are deployed by the library to provide its services. Some of the library stakeholders who prefer to use information systems and technology deployed in the library struggle to do so because of lack training and understanding on how to use the systems. The scarcity of resources such as laptops, PCs, space, human resource (limited librarians) affects the quality of service that the library offers to its stakeholders

particularly the turnaround time. The current system requires physical presence for accessibility and connectivity.

Flexibility and mobility to mobile library services is limited. Some of the library stakeholders are technologically inclined and the thought and notion of the use of emerging technologies, some of them use mobile technology only for banking, rather than library operations. Organizational structure and governance of the University library are not compatible with the culture and tradition of University and the community that the library serves. Communication and information sharing in the library is too limited to fulfill the university's goals and objectives. This attributes to time consuming, physical barriers and constrains. It is important that roles and responsibilities be clearly defined and understood by stakeholders and library employees. The Library requires a technology strategy in order to respond in accordance with the emerging technologies in order to meet the changing needs of library stakeholders and the changing technology. The obsolesce of technologies in library is due to lack of a technology strategy which has hampered some of the services which the library offers to its users and will thus hinder new innovations.

3.1 Research Methodology

This paper used a quantitative survey method to collect the data in order to investigate the adoption and use of mobile technologies for service delivery in Kashim Ibrahim Library. Questionnaires were distributed to the respondents who are professional librarians. A total of 42 professional librarians participated in the study from various divisions and units of the library. The data were analyzed descriptively using frequency counts and percentages, while Chi-square was used to test the hypothesis.

4.1 Data presentation and analysis

The presentation and analysis of data was done under descriptive statistic with respect to three research objectives and inferential statistic was used to test the research hypothesis.

Objective 1: *The first objective was set to* find out the level of awareness of mobile technologies for service delivery in Kashim Ibrahim Library, A.B.U Zaria Nigeria.

Table 1: Awareness of Mobile Technologies for Service Delivery in Kashim Ibrahim Library(KIL)

Table 1, using an average bench mark of 40%, it shows that professional

S/n	Mobile Services	Level of Awareness		
		Aware (3)	No opinion (2)	Not aware (1)
1	E-books and e-book readers:	0(0%)	20(83.33%)	4(16.67%)
2	Mobile online public access catalogs (OPACs) and databases	0(0%)	19(79.17%)	5()20.83
3	Mobile applications to the library resources and services	0(0%)	20(83.33%)	4(16.67%)
4	Mobile library collections	0(0%)	20(83.33%)	4(16.67%)
5	The overdrive service(Digital photos archive)	0(0%)	8(33.33%)	16(66.67%)
6	Mobile library instruction and mobile learning:	0(0%)	7(29.17%)	17(70.83%)
7	Library short message service (SMS) notifications	18(75%)	4(16.67%)	2(8.33%)
8	Virtual reference service using mobile device	2(8.33%)	20(83.33%)	2(8.33%)

librarians are aware of *only library short message service (SMS) notifications, recording a highest frequency of 18 (75%) response.* But they are not familiar with other mobile library technologies for service livery in library with response rate of less than 40%. *The findings further confirms that that head of divisions in the library uses* Smart phones and Laptops *to inform users about library meeting and due date reminders using library short message service (SMS) notifications.*

Objective 2: *The second objective was set to* determine the extent of mobile technologies adopted and use for service delivery in Kashim Ibrahim Library, A.B.U Zaria Nigeria.

Table 2: Extent of Mobile Technologies Adoption and Use in KIL

S/n	Mobile Services	Extent of mobile technologies adopted and use in KILs				
		To a very great extent	To a great extent	Undecided	A fair extent	No extent
1	E-books and e -book readers:	0(0%)	0(0%)	9(37.5%)	3(12.5%)	12(50%)
2	Mobile online public access catalogs (OPACs) and databases	0(0%)	0(0%)	10(41.67)	0(0%)	14(58.33%)
3	Mobile applications to the library resources and services	0(0%)	0(0%)	9(37.5%)	1(4.17%)	14(58.33%)
4	Mobile library collections	0(0%)	0(0%)	8(33.33%)	1(4.17%)	15(62.5%)
5	The overdrive service (Digital photos archive)	0(0%)	0(0%)	17(70.83%)	3(12.5)	4(16.67%)
6	Mobile library instruction and mobile learning:	0(0%)	0(0%)	12(50%)	2(8.33%)	10(41.67)
7	Library short message service (SMS) notifications	10(41.67)	2(8.33)	8(33.33%)	2(8.33%)	0(0%)
8	Virtual reference service using mobile device	0(0%)	0(0%)	7(29.17%)	1(4.17%)	16(66.67)

Table 2 shows that only *library short message service (SMS) notifications are* adopted and use *in* Kashim Ibrahim Library for service delivery with a response rate of 10 (41.67%). The study also discovered that librarians are yet to adopt and use other current mobile library technologies like *Virtual reference service, overdrive service, Mobile library instruction and mobile learning etc* for service delivery in the library. This finding is in accordance with Korturski and Frank (2011)) that developing countries are yet to adopt and use mobile library technologies to meet with the current mobile library technological revolution of the 21st century.

Objective 3: *The third objective was set to* find out the challenges face in the effective adoption and use of mobile technologies for service delivery in Kashim Ibrahim Library, A.B.U Zaria, Nigeria.

Observed data	Extent of mobile technologies adopted and use in Kashim Ibrahim Library (KIL)					Total
challenges that influences the effective adoption and use of mobile	Very great extent	Great extent	Un-decided	A fair extent	No extent	
lack of proper understanding	0	0	4	7	0	11
Scarcity of mobile devices	0	0	1	0	3	4
limited IT professionals	0	0	1	4	0	5
lack of workshops and seminars trainings	0	0	0	3	0	3
Limited Mobile technology strategy	0	0	1	0	0	1
Total	0	0	7 (7.1)	14 (13.9)	3 (3.1)	24

The researcher discovered that the challenges faced by Kashim Ibrahim Library in adopting and using of mobile technologies for service delivery are: lack of proper understanding to mobile library based technology for service delivery; scarcity of mobile devices such as Personal **Digital Assistant (PDA), IPod (Mp3 player),Tablet, e-Reader to access mobile library service**; limited IT professionals (system librarians) to handle the mobile technology literacy training instruction for information professionals in the library; lack of workshops and seminar trainings on how to use the mobile library technologies and lastly limited mobile technology strategy and techniques for service delivery in the library (free mobile applications).

4.1 Testing of Research Hypothesis

The research hypothesis was tested using Chi-square to find if there is significance relationship or not between extent of mobile technologies adoption and use and challenges face by Kashim Ibrahim Library (KIL) in the process of adoption and use of mobile technologies for service delivery. Table 3 indicates the extent of mobile technologies adoption and use and challenges face by Kashim Ibrahim Library in the process of adoption and use of mobile technologies for service delivery.

Table: 3 Significant Relationship Between Extent of Mobile Technology
Adoption and Use and Challenges faced by Kashim Ibrahim Library in
Adopting and Use of Mobile Technologies for Service Delivery

The theoretical frequencies under the null hypothesis have been computed and appear in bracket in table 3 above. The Chi Square statistics is then calculated as follows

$$x2= \frac{(fI- fi)^2}{fi}$$

Where fI = observed frequencies
fi = calculated theoretical frequency
Therefore:

$$X^2 = \frac{(0-0)^2}{0} + \frac{(0-0)^2}{0} + \frac{(7-7.1)^2}{7.1} + \frac{(14-13.9)^2}{13.9} + \frac{(3.3.1)^2}{3.1}$$

$$X^2 = 0.001 + 0.001 + 0.003 = 0.005$$

At a significant level of 0.95 and 16 degrees of freedom, the table value of chi-square is 34.28. The calculated X^2 value of 0.005 is less than the X^2 tabular value of 34.28. Since the calculated value x2 of 0.005 is less than the table value of 34.28, the research finding accepts the null hypothesis that there is a significant relationship between extent of mobile technology adoption and use and challenges faced by Kashim Ibrahim Library in the process of adoption and use of mobile technologies for service delivery. Which state that the likelihood in adopting the use of library mobile technologies depend on the challenges influencing the adoption and use by Kashim Ibrahim Library.

4.2 Result of Tested Hypothesis

Since the calculated value X^2 of 0.005 is less than the table value of 34.28 at a significant level of 0.95 and 16 degrees of freedom, The research finding accept the null hypothesis that there is a significant relationship between extent of mobile technology adoption and use and challenges face by Kashim Ibrahim Library Which state that the likelyhood in adopting and use of Library mobile technologies depend on the challenges influencing the adoption and use by Kashim Ibrahim Library.

5.1 Summary of the Findings

1. The study revealed that professional Librarian in Kashim Ibrahim Library are very much aware of *only mobile library short message service (S.M.S) notifications for services delivery but are not familiar with the*

rest of current mobile library technologies.
2. The study revealed that not all the mobile technologies are adopted and use for service delivery, only *library short message service (SMS) notifications are adopted and use for service delivery in* Kashim Ibrahim Library.
3.The study revealed the challenges faced in adoption and use of mobile technologies for service delivery in Kashim Ibrahim Library; they are lack of proper understanding to mobile library base technology for service delivery, Scarcity of mobile devices such as Personal **Digital Assistant (PDA), IPod (Mp3 player),Tablet, e- Reader to access mobile library service**, limited IT professionals (system Librarians) to handle the mobile technology literacy training instruction for information professions in the library, lack of workshops and seminars trainings on how to use the mobile library technology, limited mobile technology strategy and techniques for service delivery in the library (free mobile applications).

Conclusion
Considering the findings of the study, it can be concluded that mobile devices and technologies are not much available for library service delivery. It is also discovered that the professional librarians are not much familiar with the mobile technologies for service delivery in library, for them to adopt them and use them for service delivery to their users.

Recommendations
1. There is need for the library to purchase mobile devices like e-reader, PDA, IPod player and create library mobile application for mobile device. Library should ensure that staff are familiar with the 21st century mobile technologies like; E-*books and e-book readers, overdrive service*, *Mobile library instruction and mobile learning etc for service delivery.*

2. The library should adopt and use other mobile technologies apart from *library short message service (SMS) notifications* for service delivery to be able to catch up with the mobile technology revolution in 21st century.
3. To overcome the challenges faced by Kashim Ibrahim Library in adoption and use of mobile technology for service delivery, there should be frequent workshops and training of staff to inform them on the current mobile technologies literacy instruction in the library. Nigeria Libraries should rethink and remodel their services by using current mobile technologies for service delivery to meet with the current mobile technology revolution of 21st century

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