

Research Article

Knowledge and Utilization of Digital Applications for Effective Service Delivery in Academic Libraries in South-South Universities, Nigeria

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Abstract

This study investigated knowledge and utilization of digital applications for effective service delivery in academic libraries in South-South universities, Nigeria. 3 research questions and 3 hypotheses were raised. The population included 181 selected Librarians in the twelve (12) selected universities in South-South, Nigeria as a case study. A sample size of 119 Librarians representing 66% of the population served as respondents. Convenience sampling technique was used for the study. A 25-item questionnaire was used for data collection. Cronbach alpha statistics was used to obtain 0.73 reliability. Mean/standard deviation were used for research questions and z-test statistics was used to test the hypotheses at 0.05 level of significance. The result amongst others revealed that, Librarian in both federal and state universities are knowledgeable about Library Catalogue Apps, Library Card and Account Management Apps, Digital Preservation and Archives Apps and others. Meanwhile, Librarians in both federal and state universities poorly utilize Digital Citation Management Apps, Digital Library Card and Account Management Apps and Digital Preservation and Archives Apps. The analysis also shows that, Librarians do not utilize Digital Augmented and Virtual Reality Apps, Digital Library Events and Notifications Apps, Reading and E-Book Apps, Digital Study and Collaboration Apps and Quick Response (QR) Codes scanners. The challenges academic libraries face in promoting digital applications are inadequate skilled staff to operate digital libraries, difficulty in the enforcement of intellectual property rights, non-utilization of digital library Apps.

Keywords

Knowledge, Utilization, Digital Applications, Effective Service Delivery Academic Libraries, Challenges, Universities

1. Introduction

Before this period, academic libraries were primarily based on physical collections in accessing library materials, but the growth of information in the internet and other sources with increased usage has led academic libraries to the practice of digital library systems to provide a number of services to its users and to achieve the goal of maximizing information

resources and ensuring quality service delivery. Digital library applications are innovative library practices differently from conventional library operations that helps to simplify, synergise and operationalize library collections and services in a digitally cooperative and innovative manner. A digital library is an extensible knowledge network system under

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internet environments and a community service organization which can provide information and knowledge services for people and improve civil education for all-round development.

Generally, libraries are places where collection activity, processing and dissemination services of all kinds of information are undertaking, this requires printed and recorded material or collections in various media like films, letters news, magazines, books, tapes, videos, computers, tape recorders and others. Digital libraries are large collection of digital objects or information consisting of all types of materials and media, which are stored in digital form or repositories and are accessible through the World Wide Web and other possible means by users [13]. Consciously collected, organized, maintained and make provision of access to information and knowledge resources which help individuals, organizations and communities to attain institutional goals and objectives.

Central to the systems is massive digitization of library collection and services, e.g., storage, access, knowledge mining, digital reference services, electronic information services, search coordination, the incorporation of Artificial Intelligence (AI) in academic library operation which have seriously redefined the traditional library routine services to a more appealing, scientific and amiable service delivery without heaping much on real human operation and intelligence. AI and other library applications in the library has aided the improvement of many libraries and librarians' activities like cataloguing, retrieval, reference, indexing, information, categorization, serials functions, collection development, procurement of resource materials, among other activities [11].

Digital apps play a crucial role in modern academic libraries, helping to improve access to resources, streamline services, and enhance the overall learning and research experience. Talking about digital apps and their functionality [3, 7, 12, 15] shielded more light by unveiling some notable apps and their uses as follows:

Library Catalogue Apps which provide users with access to the library's catalog of books, journals, and other resources and users can search for materials, view item availability, place holds or requests, and receive notifications. Example is Primo by Ex Libris or Koha Mobile.

Database Access Apps that offer access to academic databases and digital collections subscribed by the library which users' searches, browse, and retrieve scholarly articles, e-books, and other resources. E.g., EBSCOhost, JSTOR, and ProQuest offer mobile apps.

Reading and E-Book Apps which allow patrons to access e-books and read them on their mobile devices. Users can borrow and download e-books, highlight text, take notes, and adjust reading settings. E.g., Libby by Over-Drive is widely used in libraries.

Citation Management Apps which users can save citations, generate bibliographies, and annotate references. E.g., Zotero

and Mendeley offer mobile apps.

Library Events and Notifications Apps that keep users informed about library events, workshops, and news. With this, push notifications, view event schedules, and register for sessions are received by users.

Library Card and Account Management Apps that users use to manage their library accounts, renew items, and view fines. It secures login, account overview, and transaction history.

Study and Collaboration Apps which help to facilitate group study, collaboration, and booking of study spaces. Users can reserve study rooms, access digital collaboration tools, and interact with peers.

Augmented Reality (AR) and Virtual Reality (VR) Apps which are used to provide immersive learning experiences and virtual tours of library spaces. Users can explore library resources and services in 3D or virtual environments. E.g., Libraries may develop custom AR/VR apps or partner with developers.

Communication and Collaboration Apps for communication and collaboration and help library staff coordinate activities, share information, internal messaging, scheduling, and project management and engage with users.

Digital Preservation and Archives Apps which are used by library professionals to digitize, archive, and preserve valuable documents, manuscripts, and collections. These Apps facilitate digitization workflows, metadata management, and long-term preservation strategies.

Digital apps are used proactively in enhancing library clients' services and digitally optimizing library operations in academic institutions to simplify and make operational standard more appealing and sophisticated. However, the acknowledge that specific library applications used may vary in different academic library based on their resources, needs and goals depending on the environment. In the same vein, [10] in his study revealed that academic libraries in Malaysia renders digital service in academic relative to chat services (library WhatsApp group).

Some mobile apps-based applications used in academic libraries to boost the collection of library materials and services as noted in some studies are Mobile databases, Mobile websites, Mobile Online Public Access Catalogue (MOPAC), Quick Response (QR) Codes, RSS, WhatsApp and SMS to boost the collection of library materials and services around the globe [16]. On the other hand, Izuagbe, Ifijeh and Ilo [8] also identified some digital platforms that eases library collections and services generally as YouTube, Zoom, Telegram, Google classroom, Messenger and WhatsApp. In addition to this, [2] study unveiled mobile-based library services e.g. SMS notifications, databases, e-mail alerts, information searching, automatic circulation of books through barcode/QR code scanners, renewing/reserving books and e-document delivery and more were services practiced to provide quality operation of library services on the users' mobile devices.

Kaddipujar, M. et al. [9] investigated app Inventor for An-

droid mobile app development using the drag-and-drop approach with respect to library at Raman Research Institute. MIT inverter-generated app with salient features which helps libraries to extend their mobile-based services to its users was explored. [1] designed and developed a mobile app for library services using open-source software. These libraries mobile-based such as mobile apps, mobile websites, check-out & check-in of documents, searching databases, SMS notifications, QR code scanners and enabling wi-fi Internet connection will help the libraries to satisfy the users' information needs and enhance library services and products that provides information accurately and instantly [16].

No matter the uniqueness of digital applications in the libraries, some notable challenges that are faced in keying to this modern practice due to many diverse requirements involving collaborative support, digital document imaging, distributed database management, rapid access, highly interactive interfaces, hypertext information retrieval, enforcement of intellectual property rights, management of multilingual collection, information mining, electronic reference service, electronic document delivery and selective. Digital libraries demand cutting edge in IT and communication infrastructure such as, optical fibre and networks which required number of workstations capable of providing online information services. Computing and multimedia applications as well as internet connectivity with sufficient bandwidth are also important, as they are capable of meeting informational and computational requirement of the user community [5].

According to [13] problems were found on digital library which includes lack of awareness of library projects, bureaucratic bottleneck in building a digital library, lack of networking (LAN/WAN or internet network), Inadequate internet access, insufficient or Poor infrastructural facilities to support digital libraries, electricity issues, inadequate skilled manpower, lack of subscriptions to electronic databases like e-book or journal supplier subscriptions, issues with digital collections that needed to be sorted for borrowing and lack of technical support. For information professionals to cope with the digital apps, they also need to be posses with digital literacy skills which are essential to effectively deliver library services in an era dominated by AI. and machine learning technologies [14].

These skills, according to [4] include librarians' familiarity with metadata creation and knowledge of copyright, traditional library skills, skills to evaluate and catalogue e-resources, management of digital contents and technical skills that will equip them to deal with digitization and archiving of the content, imaging skills, use of scanners, assigning of OCR records, knowledge of Web designing, networking, multimedia, document imaging, IT awareness and application, project management skills and others.

1.1. Statement of the Problem

It seems many information professionals in academic li-

brary are least oriented on access, adoption and usage of digital services in the libraries which consequently has led to dissatisfaction and complain of poor information service delivery by the academic librarians. No matter the important role digital library plays in helping to improve access to resources and collections, streamline services and enhancing the overall learning and research experience of users, it is alarming that many academic libraries still operate traditional library system which have drifted them away from digital operational system of library practices where digital apps are not practically operationalized.

This situation has negatively affected the progressive drive and the effective utilization of services in which digital apps are utilized in academic libraries. The operations of academic library in many universities in South-South seem to be weak in globalizing and cooperating their services due to their inability to absolutely digitalize their library services. Academic libraries in South-South seems to lack required infrastructures and manpower to fully engage in the application of digital library, AI generated content and the means to preserve and curate them. Lack of established standards and policies, inadequate trained personnel, intellectual property rights and copyright issues, unnecessary lack of collaboration between institutional managers and libraries management, poor ICT infrastructure, financial resources problems are issues that seems to have affected digital applications in academic libraries in South-South universities in Nigeria. If these issues are not well addressed, it will definitely mar the functionality of digital application that promotes the operation of our academic institutions.

1.2. Aim and Objectives of the Study

The study investigated knowledge and utilization of digital applications for effective service delivery in academic libraries in South-South universities, Nigeria. The specific objectives are to:

- 1) Examine the extent Librarians are knowledgeable of innovative digital applications for effective service delivery.
- 2) Ascertain the extent Librarians utilize innovative digital applications for effective service delivery.
- 3) Examine the challenges academic libraries face in promoting digital applications for effective service delivery.

1.3. Research Questions

- 1) How knowledgeable are Librarians on innovative digital applications for effective service delivery?
- 2) To what extent does Librarians utilize innovative digital applications for effective service delivery?
- 3) What are the challenges academic libraries face in promoting digital applications for effective service?

1.4. Hypotheses

- 1) There is. no significant difference that exists between the mean scores of Librarians in federal and state universities on how knowledgeable Librarians are on innovative digital applications for effective service delivery.
- 2) There is. no significant difference that exists between the mean scores of Librarians in federal and state universities on the extent Librarians utilize innovative digital applications for effective service delivery.
- 3) There is. no significant difference that exists between the

mean scores of Librarians in federal and state universities on the challenges academic libraries face in promoting digital applications for effective service delivery.

2. Methodology

The research employed descriptive survey. The population included 181 selected Information Professionals in the twelve (12) selected universities in South-South, Nigeria as a case study. The universities are as shown in the table below:

Table 1. Table showing the number of universities and number of librarians in each university.

	UNIVERSITY TYPE	NO. of Librarians
	FEDERAL	
1.	Federal University, Otuoke	08
2.	Federal University of Petroleum Resources	10
3.	University of Port Harcourt	22
4.	University of Benin	26
5.	University of Calabar	12
6.	University of Uyo	15
	STATE	
1.	Delta State University Abraka	21
2.	Rivers State University	19
3.	Niger Delta University (NDU)	13
4.	Akwa Ibom State University	13
5.	Ignatius Ajuru University of Education	11
6.	Cross River State university of science and Technology	11

A sample size of 119 Librarians in the 12 universities in South-South, Nigeria representing 66% of the population served as respondents. Convenience sampling technique was used for the study. The reason for this technique is due to participants being selected based on their convenience or accessibility to the researcher without strict randomization. In doing this, the researcher administered the questionnaire to Information Professionals that were available as at the time of the study. The instruments employed to get data was a 25-item questionnaire titled: "Knowledge and Utilization of Digital Applications for Effective Service Delivery in Academic Libraries Questionnaire" (KUDAESDALQ). The questionnaire instrument was divided into 2 sections: section A was for demographic data of the respondents, while section B was a 25 items questionnaire used to gather respondent responses to the questions raised. The criterion means of 2.50 was used as the bench mark for agreeing or disagreeing to the responses

in the mean calculations in the study.

The 4- points modified likert rating scale of High Extent Strongly Agree (SA) = 4 points; Agree (A) = 3 points; Disagree (D) = 2 points; and Strongly Disagree (SD) = 1 point) and Highly Utilized (HU)=4, Moderately Utilized (MU)=3, Poorly Utilized (PU)=2 and Not Utilized (NU)=1, was used as response options that guided the respondents' opinions on the instrument. Cronbach alpha statistics was used to get 0.74 reliability. Mean/standard deviation was employed to respond to the research questions and z-test statistics to test the hypotheses at 0.05 significance level.

3. Results and Discussion

Research Question 1: How knowledgeable are Librarians on innovative digital applications for effective service delivery?

ery in academic libraries in South-South universities, Nigeria?

Table 1. Mean/Standard Deviation Analysis of Federal and State University Librarians in South-South on how knowledgeable Librarians are on innovative digital applications for effective service delivery.

S/N	Items	Librarians in Federal University (65)		Librarians in State University (54)		\bar{X} \bar{X}		Remark
		\bar{X}	SD	\bar{X}	SD			
1.	As a Librarian, I have knowledge of Library Catalogue Apps which provide users with access to library collections and services	3.05	1.25	3	1.23	3.03		Agree
2.	As a Librarian, I have knowledge of Citation Management Apps which users can save citations, generate bibliographies and annotate references	2.12	1.18	2.13	1.19	2.13		Disa-greed
3.	As a Librarian, I have knowledge of Library Card and Account Management Apps that users use to manage their library accounts, renew items, and view fines	2.74	1.14	3.19	1.32	2.97		Agreed
4.	As a Librarian, I have knowledge of Augmented and Virtual Reality Apps used to provide immersive learning experiences and virtual tours of library spaces.	2.01	1.22	2.29	1.20	2.15		Disa-greed
5.	As a Librarian, I have knowledge of Digital Preservation and Archives Apps used to digitize, archive and preserve valuable documents/ collections	3.07	1.26	2.68	1.13	2.88		Agreed
6.	As a Librarian, I have knowledge of Library Events and Notifications Apps that keeps users informed about library events, workshops and news	1.99	1.23	2.17	1.17	2.08		Disa-greed
7.	As a Librarian, I have knowledge of Reading and E-Book Apps which allow patrons to access e-books and read them on their mobile devices.	2.63	1.13	3.1	1.27	2.87		Agree
8.	As a Librarian, I have knowledge of Study and Collaboration Apps which help to facilitate group study, collaboration and booking of study spaces	2.02	1.23	2.12	1.18	2.07		Disa-greed
9.	As a Librarian, I have knowledge of Quick Response (QR) Codes scanners for the enhancement of library collections and services	2.29	1.20	2.12	1.18	2.21		Disa-greed
10.	As a Librarian, I have knowledge of Communication and Collaboration Apps that help to coordinate activities and share information among Librarians	3.12	1.28	2.60	1.22	2.86		Agreed
Grand mean and standard deviation		2.84	1.13	2.87	1.03			

Table 1 indicated that item number 1 had the highest mean score of 3.03, followed by item 3 with 2.97, item 5 with 2.88, item 7 with 2.87 and item 10 with 2.86. Since these items are above 2.50 criterion mean, it indicated that Librarian in both federal and state universities are knowledgeable about Library Catalogue Apps which provide users with access to library collections and services, Library Card and Account Management Apps that users use to manage their library accounts, renew items, and view fines, Digital Preservation and Ar-

chives Apps used to digitize, archive and preserve valuable documents/ collections, Reading and E-Book Apps which allow patrons to access e-books and read them on their mobile devices and Communication and Collaboration Apps that help to coordinate activities and share information among Librarians.

Meanwhile, items 2, 4, 6, 8 and 9 had mean scores below the criterion mean of 2.50, indicating that Librarian in both federal and state universities are not knowledgeable about Citation

Management Apps which users can save citations, generate bibliographies and annotate references, Augmented and Virtual Reality Apps used to provide immersive learning experiences and virtual tours of library spaces, Library Events and Notifications Apps that keeps users informed about library events, workshops and news, Study and Collaboration Apps which

help to facilitate group study, collaboration and booking of study spaces and Quick Response (QR) Codes scanners for the enhancement of library collections and services.

Research Question 2: To what extent do Librarians utilize innovative digital applications for effective service delivery in academic libraries in South-South universities, Nigeria?

Table 2. Mean/Standard Deviation Analysis of Federal and State University Librarians in South-South on the extent Librarians utilize innovative digital applications for effective service delivery in academic libraries in South-South universities, Nigeria.

S/N	Items	Librarians in Federal University (65)		Librarians in State University (54)		Remark	
		\bar{X}	SD	\bar{X}	SD	\bar{X}	\bar{X}
1.	To what extent do you utilize Digital Library Catalogue Apps to provide users with access to library collections and services	2.63	1.13	3.1	1.27	2.87	MU
2.	To what extent do you utilize Digital Citation Management Apps to help users can save citations, generate bibliographies and annotate references	2.12	1.18	2.01	1.22	2.07	PU
3.	To what extent do you utilize Digital Library Card and Account Management Apps to help users manage their library accounts, renew items and view fines	2.01	1.22	2.29	1.20	2.15	PU
4.	To what extent do you utilize Digital Augmented and Virtual Reality Apps to provide immersive learning experiences and virtual tours of library spaces.	1.89	1.27	1.60	1.37	1.75	NU
5.	To what extent do you utilize Digital Preservation and Archives Apps to archive and preserve valuable documents/collections	2.02	1.23	2.12	1.18	2.07	PU
6.	To what extent do you utilize Digital Library Events and Notifications Apps to keep users informed about library events, workshops and news	1.80	1.32	1.60	1.37	1.7	NU
7.	To what extent do you utilize Reading and E-Book Apps to allow patrons access e-books and read them on their mobile devices.	1.83	1.32	1.85	1.29	1.84	NU
8.	To what extent do you utilize Digital Study and Collaboration Apps to help facilitate group study, collaboration and booking of study spaces	1.89	1.27	1.94	1.25	1.92	NU
9.	To what extent do you utilize Quick Response (QR) Codes scanners to enhance library collections and services	1.99	1.23	1.89	1.27	1.94	NU
10.	To what extent do you utilize Digital Communication and Collaboration Apps to help coordinate activities and share information among Librarians	2.80	1.36	3.12	1.28	2.96	MU
Grand mean and standard deviation		2.10	1.25	2.15	1.03		

Table 2 indicated that item number 10 had the highest mean scores of 2.96 and item 1 with 2.86. The two scores were above 2.50 which is the criterion mean, this implies that, to a moderate extent librarians utilize Digital Communication and Collaboration Apps to help coordinate activities and share

information among Librarians and they also utilize Digital Library Catalogue Apps to provide users with access to library collections and services. Meanwhile, items 2, 3, 4, 5, 6, 7, 8 and 9 had mean scores below the criterion mean of 2.50, indicating that Librarians in both federal and state universities

poorly utilize Digital Citation Management Apps, Digital Library Card and Account Management Apps and Digital Preservation and Archives Apps to archive and preserve valuable documents/collections. The analysis also shows that, Librarians in both federal and state universities do not utilize Digital Augmented and Virtual Reality Apps, Digital Library Events and Notifications Apps. They do not utilize Reading

and E-Book Apps, Digital Study and Collaboration Apps and Quick Response (QR) Codes scanners to enhance library collections and services.

Research Question 3: What are the challenges academic libraries face in promoting digital applications for effective service delivery in academic libraries in South-South universities, Nigeria?

Table 3. Mean and Standard Deviation Analysis of Librarians in Federal and State Universities on the challenges academic libraries face in promoting digital applications for effective service delivery in academic libraries in South-South universities, Nigeria.

S/N	Items	Librarians in Federal University (65)		Librarians in State University (54)			
		\bar{X}	SD	\bar{X}	SD	\bar{X}	\bar{X}
1	Inadequate skilled staff to operate digital libraries	2.89	1.21	3.17	1.17	3.03	Agreed
2	Difficulty in the enforcement of intellectual property rights	2.8	1.14	2.89	1.18	2.85	Agreed
3	Non utilization of digital library Apps the potentials and capabilities of people with special needs	3.01	1.23	3.19	1.31	3.1	Agreed
4	lack of awareness on digital library Apps that can be used effective digital service delivery	2.7	1.36	2.66	1.32	2.68	Agreed
5	Bureaucratic bottleneck in building a digital library.	2.9	1.19	2.92	1.14	2.91	Agreed
Grand mean and standard deviation		2.86	1.23	2.97	1.23	2.91	

Table 3 indicated that items number 3 had the highest mean scores of 3.1 followed by item 1 with 3.03, item 5 with 2.91, item 2 with 2.85 and item 4 with 2.91 respectively. The various scores are above the criterion mean of 2.50. It means that, the challenges academic libraries face in promoting digital applications are inadequate skilled staff to operate digital libraries, difficulty in the enforcement of intellectual property rights, non-utilization of digital library Apps the potentials and capabilities of people with special needs. lack of aware-

ness on digital library Apps that can be used effective digital service delivery and bureaucratic bottleneck in building a digital library.

Test of Hypotheses

Ho₁: There is. no significant difference that exists between the mean scores of Librarians in federal and state universities on how knowledgeable Librarians are on innovative digital applications for effective service delivery in academic libraries in South-South universities, Nigeria.

Table 4. z-test Analysis of the Difference between the Opinions of Librarians in Federal and State Universities on how knowledgeable Librarians are on innovative digital applications for effective service delivery in academic libraries in South-South universities, Nigeria.

Subject	N	\bar{x}	SD	Df	z-cal.	z-crit.	Level of Sig	Remark
Librarians in Federal University	65	2.84	1.13	2 117	-0.15	± 1.96	0.05	Accepted
Librarians in State University	54	2.87	1.03					

Hypothesis 2 revealed that z-calculated value of -0.15 to be less than z-critical value of ± 1.96 and degree of freedom of 117 basing it on 0.05 level significance. The null hypothesis is retained. Therefore, no significant difference that exists between Librarians in federal and state universities based their mean scores with respect to knowledgeable Librarians are on innovative

digital applications for effective service delivery.

Ho₂: No significant difference exists between Librarians in federal and state universities based on their mean scores regarding the extent Librarians utilize innovative digital applications for effective service delivery in academic libraries in South-South universities, Nigeria.

Table 5. *z-test Analysis of the Difference between the Opinions of Librarians in Federal and State Universities on the extent Librarians utilize innovative digital applications for effective service delivery.*

Subject	N	\bar{x}	SD	Df	z-cal.	z-crit.	Level of Sig	Remark
Librarians in Federal University	65	2.10	1.25	2	-0.24	± 1.96	0.05	Accepted
Librarians in State University	54	2.15	1.03	117				

Hypothesis 2 revealed that z-calculated value of -0.24 to be less than z-critical value of ± 1.96 and degree of freedom of 117 basing it on 0.05 level significance. The null hypothesis is retained. Therefore, no significant difference that exists between Librarians in federal and state universities based their mean scores with respect to Librarians who utilize innovative digital applications for effective service.

Hypothesis 3 revealed that z-calculated value of -0.49 to be less than z-critical value of ± 1.96 and degree of freedom of

117 basing it on 0.05 level significance. The null hypothesis is retained. Therefore, no significant difference that exists between Librarians in federal and state universities based their mean scores with respect to challenges academic libraries face in promoting digital applications.

Ho₃: No significant difference exists between Librarians in federal and state universities based on their mean scores regarding the challenges academic libraries face in promoting digital applications for effective service delivery in academic libraries.

Table 6. *z-test Analysis of the Difference between the Opinions of Librarians in Federal and State Universities on the challenges academic libraries face in promoting digital applications for effective service delivery in academic libraries.*

Subject	N	\bar{x}	SD	Df	z-cal.	z-crit.	Level of Sig	Remark
Librarians in Federal University	65	2.86	1.28	2	-0.49	± 1.96	0.05	Accepted
Librarians in State University	54	2.97	1.23	117				

Hypothesis 3 revealed that z-calculated value of -0.49 to be less than z-critical value of ± 1.96 and degree of freedom of 117 basing it on 0.05 level significance. The null hypothesis is retained. Therefore, no significant difference that exists between Librarians in federal and state universities based their mean scores with respect to challenges academic libraries face in promoting digital applications.

4. Summary of Findings

It was found that, Librarian in both federal and state universities are knowledgeable about Library Catalogue Apps, Library Card and Account Management Apps, Digital Preservation and Archives Apps, Reading and E-Book Apps and Communication and Collaboration Apps. Meanwhile, Librarians are not knowledge about Citation Management Apps, Augmented and Virtual Reality Apps, Library Events and Notifications Apps, Study and Collaboration Apps and

Quick Response (QR) Codes scanners.

It was found that, to a moderate extent librarians utilize Digital Communication and Collaboration Apps and Digital Library Catalogue Apps. Meanwhile, Librarians in both federal and state universities poorly utilize Digital Citation Management Apps, Digital Library Card and Account Management Apps and Digital Preservation and Archives Apps. The analysis also shows that, Librarians do not utilize Digital Augmented and Virtual Reality Apps, Digital Library Events and Notifications Apps, Reading and E-Book Apps, Digital Study and Collaboration Apps and Quick Response (QR) Codes scanners.

It was also found that, the challenges academic libraries face in promoting digital applications are inadequate skilled staff to operate digital libraries, difficulty in the enforcement of intellectual property rights, non-utilization of digital library Apps, the potentials and capabilities of people with special needs. lack of awareness on digital library Apps that can be

used effective digital service delivery and bureaucratic bottleneck in building a digital library [6].

5. Discussion of Findings

The finding of research question one is in consonance with the findings of [4] who found that librarians need knowledge of metadata creation and knowledge of copyright, traditional library skills, skills to evaluate and catalogue e-resources, management of digital contents and technical skills that will equip them to deal with digitization and archiving of the content and others.

The findings of research question two is in agreement with the works of [16] whose study revealed some mobile app-based applications used in academic libraries to boost the collection of library materials and services as noted in some studies are Mobile databases, Mobile websites, Mobile Online Public Access Catalogue (MOPAC), Quick Response (QR) Codes, RSS, WhatsApp and SMS to boost the collection of library materials and services around the globe. Ali, M., & Asl, N. S. [2] study unveiled mobile-based library services e.g. SMS notifications, databases, e-mail alerts, information searching, automatic circulation of books through barcode/QR code scanners, renewing/reserving books and e-document delivery and more were services practiced to provide quality operation of library services on the users' mobile devices.

The finding of research question three is in line with [13] who found several digital library problems to include lack of awareness of digital library projects, bureaucratic bottleneck in building a digital library, lack of networking (LAN/WAN or internet network), Inadequate internet access, insufficient or poor infrastructural facilities to support digital libraries, electricity issues, inadequate skilled staff to operate digital libraries.

6. Conclusion

Digital apps play a crucial role in modern academic libraries, helping to improve access to resources, streamline services, and enhance the overall learning and research experience. The knowledge of digital applications helps librarians to be digitally productive in delivering library services.

7. Recommendations

- 1) Librarians need put in their best to explore the potentials in digital library operation by equipping their selves with digital training especially through university and management sponsored programmes to enhance librarian's skills in the use of ICT and other applications.
- 2) When using library applications, librarians need consider privacy issues not to infringe on laws relating to copy right and related others.
- 3) Government at the federal and state levels should deem

it necessary to collaborate with university management to make provision of infrastructure facilities and other ICT facilities and equipment to aid the practical utilization of digital applications in the libraries to meet the global practice of library users.

Author Contributions

Comfort Nwaju Owate is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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