Information and Knowledge Management
ISSN 2224-5758 (Paper) ISSN 2224-896X (Online)
Vol.5, No.3, 2015

Application of Computer Technologies to Circulation Services in University and Research Institute Libraries in North Central Nigeria

Aba Jane Ph.D CLN Ezeani, C.N. Ph.D CLN Cyprian I . Ugwu Ph.D CLN
Francis Suleimanu Idachaba Library, University of Agriculture Makurdi Benue State-Nigeria
aba.Jane@uam.edu.ng

Abstract
The study focused on application of computer technologies to circulation services in university and research institute libraries in North Central, Nigeria. Application of computer technology in this study is the act of using computer, storage devices, computer accessories and internet to improve the slow quality of circulation services. Descriptive survey was used as design of the study. The study covered 13 university libraries and 19 research institute libraries in North Central, Nigeria. The population of this study was 234 librarians. Sample size for this study was made up of entire population. Research instruments was Questionnaire developed by the researchers titled "Questionnaire on Application of Computer Technologies to Circulation Services in Libraries" (QACTCSIL). A response rate of 183(78.21%) was recorded. Data collected were analyzed using frequency counts, percentages (%), mean ($\overline{X}$) and standard deviation (SD). The findings revealed percentage availability (76.92%) of computer technologies in university libraries and (83.04%) in research institute libraries. Computer technologies was used to a little extent for circulation services ($\overline{X}$ =2.52) in university libraries while in research institute libraries the grand mean of ($\overline{X}$ =2.88) showed that computer technologies was highly used for the provision of circulation services. Although, the study revealed that librarians were skilled in the use of computer technologies (59.34%) in university libraries and ((72.12%) in research institute libraries but these skills was not used to collect overdue fines in most university libraries. The grand mean of ($\overline{X}$ =2.69) revealed problems that hindered the application of computer technologies to circulation services and the greatest of these was irregular supply of power in university libraries in North Central, Nigeria. The grand mean of ($\overline{X}$ =2.33) revealed that research institute libraries in North Central, Nigeria had very few constraining factors; the greatest of these factors was inadequate funding ($\overline{X}$ =2.73). These findings showed that all the identified strategies was appropriate for enhancing the application of computer technologies to circulation services in university libraries ($\overline{X}$ =3.36). The strategies proposed was found to be appropriate for enhancing the application of computer technologies to circulation services in research institute libraries ($\overline{X}$ =2.72); the most appropriate was found to be adequate funding for computer technologies equipment in research institute libraries in North Central, Nigeria. It was recommended among others that available computer technologies should be regularly serviced, maintained and effectively used for circulation services; university libraries should be encouraged to boost morale of users and improve efficiency; library managements should encourage and sponsor librarians to vigorously pursue continuous training; librarians should also be encouraged to look inward in developing their own programs with the help of programmers; library managements should address irregular power supply; inadequate computer technology infrastructure and inadequate funding that hindered effective application of computer technologies in circulation services for effective and efficient services in university and research institute libraries.
Keywords: Circulation Services, Computer and Technologies

Introduction

The use of computer technologies in libraries has provided a new kind of library interface in terms of librarians' and patrons' attitudes, affecting libraries and their services. Computer can be of tremendous assistance either in easing the arduous task of manual processing or time saving in the retrieval of information (Saadi, 2002). It has also brought tremendous changes in library operations and services (Ogbonna, 2003). Besides, we live in an information age, and libraries are expected to use computer technologies to provide information more expeditiously and exhaustively than before. It is the responsibility of libraries to render certain services to their users to ensure maximum use of library materials. The services provided by individual libraries are basically a function of the objectives of parent organizations. This differs from one library to another but certain services are common to all libraries such as circulation services. In line with Ranganathan (1931) five laws of librarianship "books are for use.'' The term book should be interpreted broadly to stand for library materials. This law would be fulfilled if right materials and right users can be brought together. The aim of applying computer technologies

in information services should be to achieve the same. Library materials will not be fully used unless computer technologies are used to assist users to help themselves. This would lead to greater use of library materials. The second law states that "every user his book." Here emphasis is on library user. Librarian should know users and their requirements, so that the right informational materials can be provided for every user. The third law prescribes, "every book its user". Emphasis is on library materials. The librarian should know about library materials and try to find out a user for every one of these. He should find out who will benefit most from a given material. Thus acting as a canvassing agent for each material. The librarian should constantly up-date information with specific users needs in mind so that the user can easily locate its content e.g sending alert of new arrivals to users e-mail addressess, twitters, face book and blog. Thus, this study examined application of computer technologies to circulation services in university and research institute libraries in North Central, Nigeria. Application of computer technology in this study is the act of using computer, storage devices, computer accessories and Internet to improve the quality of circulation services.

Statement of the Problem

In recent times, computer technologies such as the computer, Compact Disk Read Only Memory (CD-ROM) and the internet have revolutionalized circulation services. Apart from providing wide access to information and new instructional possibilities, it has also succeeded in providing timely information to library users by reducing the time lag between generating and accessing such useful information. Hence, there is a felt need for the extensive use of computer technologies to effectively discharge circulation services (Madu, 2002). The effect of non utilization of computer technologies in delivering circulation services undermines the functions of a 21st - century librarian, thus constituting frustrations for users' ability to effectively and efficiently use the libraries under study in an information age such as this. This is due to the fact that library users cannot do without the use of these modern technologies. The researcher also observed that the present state of circulation services in university and research institute libraries in North Central, Nigeria is bedeviled by a number of problems ranging from inadequate funding through inadequate skills in the use of computer technologies to lack of computer technologies infrastructure. The consequences of these could lead to inability of the libraries under study to provide current and timely information to their users. It may also lead to inability of these libraries to meet their users' information needs. Therefore, the problem of this study is to investigate into the application of computer technologies to circulation services in university and research institute libraries in North Central, Nigeria.

Objectives of the Study

The main purpose and specific objectives of the study include the following:

1. determine availability of computer technologies for circulation services in university and research institute libraries in North Central Nigeria.
2. ascertain extent to which computer technologies are used for circulation services in university and research institute libraries in North Central Nigeria.
3. find out librarian's skills in applying computer technologies to circulation services in university and research institute libraries in North Central Nigeria.
4. determine level of expertise of librarians in the use of library application software packages for circulation services in university and research institute libraries in North Central Nigeria.
5. examine constraints against effective application of computer technologies to circulation services in university and research institute libraries in North Central Nigeria.
6. identify strategies for improving application of computer technologies to circulation services in university and research libraries in North Central Nigeria.

Research Questions

This study sought answers to the following questions:

1. What are available computer technologies for circulation services in university and research institute libraries?
2. To what extent are computer technologies used for circulation services in university and research institute libraries?
3. In which of the circulation services are librarians skilled in the use of computer technologies?
4. What are the levels of expertise of librarians in use of library application software packages for circulation services in university and research institute libraries?
5. What are the constraints that affect application of computer technologies to circulation services in university and research institute libraries?
6. What are the strategies employed to address constraints that affect application of computer technologies to circulation services in university and research institute libraries?

Literature Review

Circulation services refer to processes in which library materials are loaned out to library users through lending procedures operating in libraries. It relates to charging and discharging of library materials from users and back to the library over a period of time (Ode and Omokaro, 2002). Various methods of circulation techniques are in use and the most popular is Browne system (Prytherch, 1986) which requires the use of:

a) Readers ticket which determines the number of books that can be borrowed at a time.
b) Book pocket to accommodate book card.
c) Book card which carries details of title, author and call number of book.
d) Date due label on which date by which material must be returned is indicated.

This system allows library staff to loan out library materials and maintain details of who borrowed what and when to return it. Computer technologies can be used to eliminate cumbersome process of charging and discharging in the manual process of circulation. Similarly, maintenance of borrowers list, overdue materials can automatically be done through automated resources. Edoka (2000) listed circulation services to include: registration of users, reserving materials for needy users, short loan services, shelving and shelf-reading, keeping of accurate record of transactions and keeping of necessary statistics.

Circulation services, according to Olufeagba (1977), involve mechanization of activities such as charging of books to users, renewing of books; processing, reservation, monitoring utilization of books; operating short-term loans of document, overdue notices and calculating fines, discharging returned materials and checking for possible old requests. Consequently, a lot of time is wasted in carrying out these functions manually. Application of computer technologies in circulation services as observed by Nkhoma (2003) is the cherished goal of any library whereas manual charging is characterized by long queues and unnecessary delays which are prevalent in libraries. The filling of users` cards and keeping of statistics is not only cumbersome but also out of control as filling of cards spills over to next day on several occasions. As a result there is urgent need for application of computer technologies in circulation services in research institute and university libraries.

Computer application in circulation operations enhances the process of lending and locating library information. It also provides up-to-date information on loan services, accurate dissemination of information on overdue items; usage statistics and pre-preparations of printed circulation lists, information on fines and payment from library defaulters (Otolo and Anie, 2009). Similarly, Ezeani (2010) supported the view that task of circulation section of library can be made easier by use of computer technologies. Borrowers can carry out self-issue over Internet in certain libraries. Status of borrower can be ascertained if lending limits have been reached. Borrower is automatically made to see which other items are on loan. Computer could also reveal if requested material is mutilated or out of circulation. Provision can also be made to reserve desired informational materials. Besides, data provided by computerized circulation system can contribute to effective management of stock. Library at a glance, can also know the amount of fines collected. Invariably, time for sorting of overdue cards is saved.

Computers have enhanced efficiency and librarians must acquire relevant computer skills and competencies to make their profession and roles relevant in this information-driven age. Brain (2007), Okore and Ekere (2008), Anunobi and Nwabueze (2010) wrote on skills required by librarians to work effectively in the information environment. These skills can be grouped into three areas namely, strong technical skills, information literacy instruction skills and content management skills. Skills could be classified as general professional requirements which could change traditional librarianship. Ezeani and Ekere (2009) also observed that librarians must be versatile in the use of computer technologies as this will encourage diversity and build a foundation for continuous innovative learning. Hence, librarians must re-interpret traditional library skills and explore new ways of utilizing these skills through effective use of computer technologies.

Consquently, Babafemi and Adedibu (2007) studied application of computer technology in circulation subsystem of the central library of Federal University of Agriculture, Abeokuta, Nigeria. A structured questionnaire was designed and administered to ten (10) professional librarians in circulation section of the library. Descriptive research method was used. Data collected were analyzed using simple percentages and chi-square method. Result showed that library automation is a capital project and university administration should provide enough fund for library automation. Alumni associations and friends of libraries should also be involved in sourcing funds for libraries. Federal government should implement statutory allocations for library in universities' budgets. Libraries should encourage production of local library application software by patronizing them and even be part of software development. There should be constant training and re-training of staff in handling of computer technology. More of these technologies should be available for staff while obsolete ones should be replaced. This study is relevant to this research because, it seeks to find out the use of computer technology to improve circulation services to enhance reading and research.

Methodology

The study adopted descriptive research design. The study covered 13 university libraries and 19 research

institute libraries in North Central, Nigeria. The population of this study was 234 librarians. Sample size for this study was made up of entire population. Research instruments were Questionnaire and a checklist was developed by researcher titled "Questionnaire on the Application of Computer Technologies to Circulation services in Libraries" (QACTCSIL). A response rate of 183(78.21%) was recorded. Data collected were analyzed using frequency counts, percentages (%), mean ($\overline{X}$) and standard deviation (SD)

Discussion of Findings

Table 1 captures availability of computer technologies in university libraries and research institute libraries and pie charts showing a pictorial representation of availability of computer technologies.

Table1: Percentage of Available Computer Technologies for circulation Services in University Libraries

S/No	Items	University Libraries	Research Institute Libraries
1	Computer Units	12 (92.30%)	18 (94.73%)
2	Computer Accessories	11 (84.62%)	16 (84.62%)
3	Scanners	9 (69.23%)	14 (73.68%)
4	Printers	10 (76.92%)	17 (89.47%)
5	External Storage Devices	9 (69.23%)	15 (78.95%)
6	CD-ROM	9 (69.23%)	12 (63.16%)
7	Internet	10 (76.92%)	17 (89.47%)
8	System software	10 (76.92%)	17 (89.47%)
9	Application software	10 (76.92%)	16 (84.21%)
	Average of percentage availability	**76.92**	**83.04**

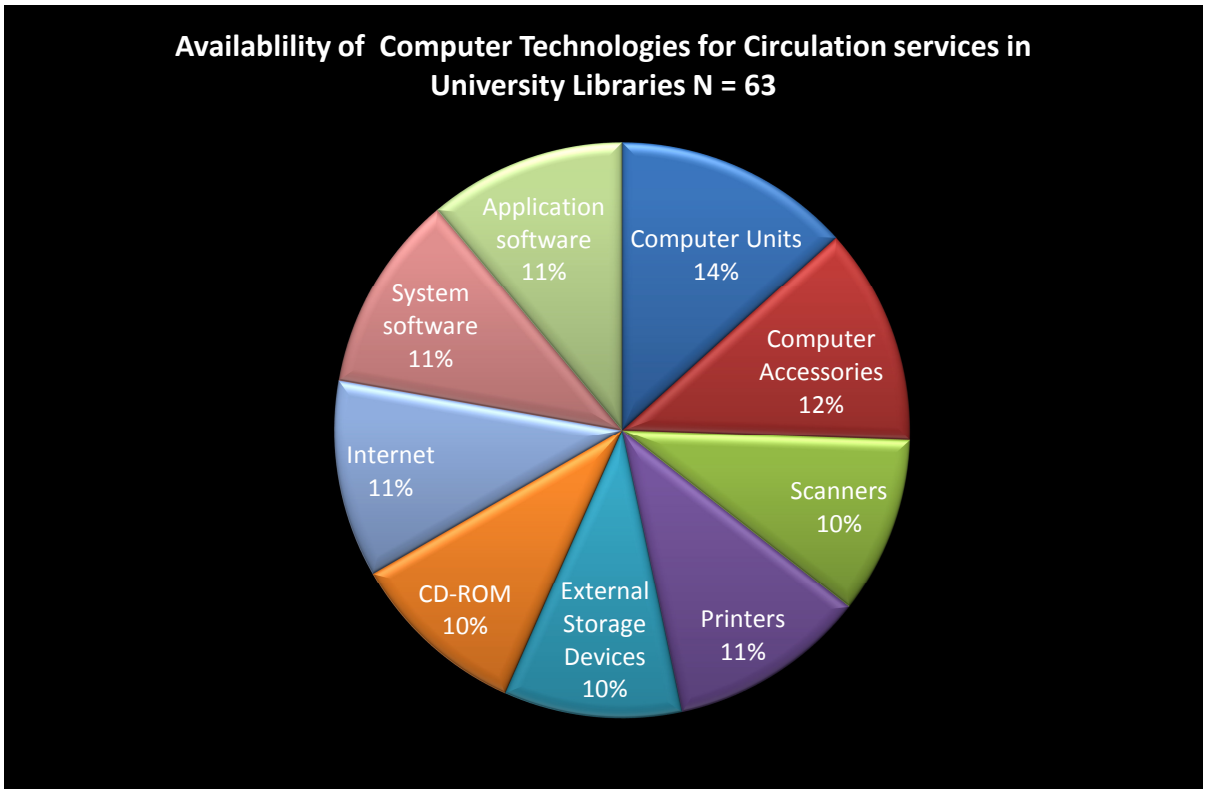

Fig.3 Average of percentage availability 76.92 Available

Results revealed that (92.3%) of computer units were available. Also available were computer accessories (84.6%); Internet (76.9%), and system software (76.9%). Besides, average percentage of availability of 76.92% showed that computer technologies were available in university libraries in North Central Nigeria. This means that these libraries had computer technologies support for effective and efficient circulation services delivery.

Table 2: Percentage of Available Computer Technologies for Circulation Services in Research institute libraries

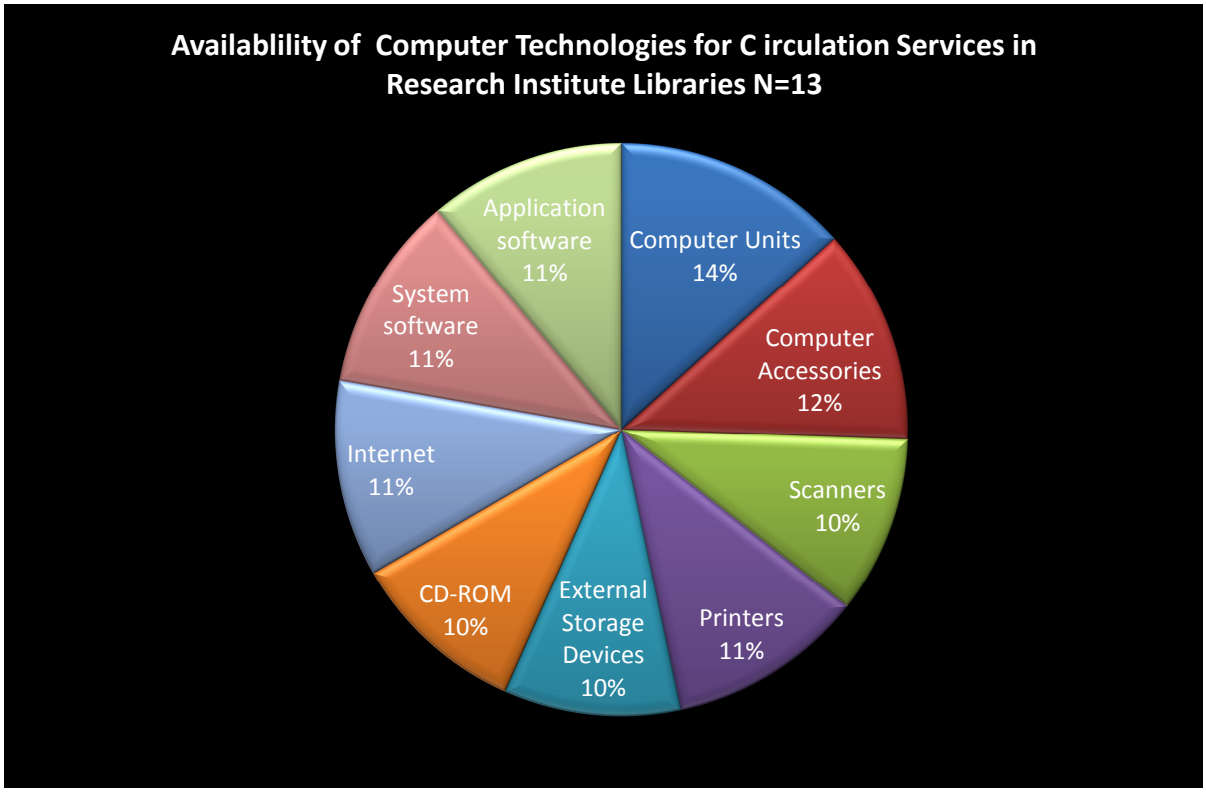

Fig.4 Average of percentage availability 83.04 Available

Table 2 and the accompanying pie chart showed percentage availability of computer technologies in research institute libraries in North Central Nigeria. Result revealed that computer units (94.7%); Internet (89.5%), systems software (89.5%), printers (89.5%), computer accessories (84.2%) and application software (84.2%) were readily available. Average percentage of availability of 83.04% revealed that computer technologies were highly available in research institute libraries in North Central Nigeria. This implied that these libraries have strong computer technologies support for effective circulation services. This result confirms Ainoko and Boman (2009) discovery that availability and accessibility of computer technologies is a pre-requisite for information service delivery. In addition, this study also agrees with Etebu (2010) findings that universities have an array of computer technologies to advance their services. This can be deduced from list of hardware and software computer technologies readily available in libraries under study. Thus, library users can benefit from current information from varied sources to meet their information needs.

Table 3 considered computer technology application in circulation services in university and research institute libraries.

Table 3: Mean and Standard Deviation of Responses on Extent of Computer Technologies Used for Circulation Services in University and Research Libraries.(University libraries N=120; Research Institute Libraries N=63)

S/No	Items	University Libraries		Research Institute Libraries	
		Mean	SD	Mean	SD
1	Computers	2.55	1.12	2.90	1.06
2	Scanners	2.44	1.18	2.97	1.08
3	Printers	2.50	1.11	2.95	1.17
4	CD-ROM	2.37	1.09	2.94	1.09
5	Internet services	2.72	1.17	2.65	1.36
	Grand Mean	**2.52**	**0.88**	**2.88**	**0.96**

VHE-Very High Extent, HE- High Extent; LE-Little- Extent; NAA-Not At All

Table 3 revealed that Internet (2.72), computer units (2.55), printers (2.50) were highly used for circulation services in these university libraries. However, scanners (2.44) and CD-ROM (2.37) were used to little extent for

circulation services. Overall computer technologies were used to a high extent $\overline{X}$ =2.52 for circulation services in university libraries in North Central Nigeria.

While in research institute libraries we have the following: scanners (2.97), printers (2.95), CD-ROM (2.94) computer units (2.90) and Internet (2.65) which are highly used for circulation services in research institute libraries. Grand mean of 2.88 showed that these technologies were highly used for circulation services in research institute libraries. This means that computer technologies were used for circulation services in research institute libraries in North Central Nigeria. Findings of this study agree with Venezaeno (1992), Babafemi et al (2007) and Ezeani (2010) that the use of computer technologies in circulation sub system of libraries is inevitable for effective and efficient performance of information service delivery.

Tables 4 displayed the percentage of skilled librarians in university libraries and research institute libraries.

Table 4: Librarians' Responses in Use of Computer Technologies in University and Research institute Libraries.

S/No	Services	University Libraries	Research Institute Libraries
1	Lending services	65 (54.2%)	48 (76.2%)
2	Circulation services	72 (60.0%)	53 (84.1%)
3	Charging and Discharging	73 (60.8%)	45 (71.4%)
4	Overdue fine	38 (31.7%)	36 (57.1%)
5	Overdue notice	60 (50.0%)	47 (74.6%)
6	Storing and copying data into secondary storage devices (CD-ROM)	82 (68.3%)	53 (84.1%)
7	Scanning of images for inclusion into texts	67 (55.8%)	39 (61.9%)
8	Retrieving information from storage devices	93 (77.5%)	53 (84.1%)
9	Printing data/information	91 (75.8%)	35 (55.6%)
10	**Average percentage of skilled librarian**	59.34%	**72.12**

Table 4 revealed that librarians are skilled in applying computer technologies to retrieving of information from storage devices (77.5%), printing data/information (75.8%) and storing and copying data into secondary storage devices (68.3%). However, librarians were not skilled in applying these technologies to overdue fine (31.7%) in university libraries in North Central Nigeria.

While research institutes librarians are skilled in applying computer technologies in: circulation services (84.1%), storing and copying data into secondary storage devices (84.1%); retrieving of information from storage devices (84.1%) and lending services (76.2%), charging and discharging services (71.4%) and overdue notice (74.6%). These findings imply that librarians are skilled in applying computer technologies in circulation services in research institute libraries in North Central Nigeria. This confirms the findings of Akintunde (2003) and Obasuyi (2005) who submitted that it is by training and retraining of librarians in computer technology skill acquisition and application that competence and performance of librarians in circulation services can be enhanced.

Tables 5 showed software packages and their application in university and research institute libraries.

Table 5: Frequencies and Percentages of Librarians' Response on Library Application Software Packages Used for Circulation Services in University and research institute Libraries

S/No	Services	University Libraries	Research Institute Libraries
1	**Knowledge of Library software package**	**31 (22.6)**	20 (29.3%)
2	Tinlib	39 (25.8)	19 (31.1%)
3	X-Lib	22 (18.3)	26 (41.3%)
4	GLAS (Graphical Library Automation System)	32 (26.7)	13 (20.6%)
5	Alice for Windows	39 (25.8)	13 (20.6%)
6	Greenstone	16 (13.3)	19 (31.1%)
7	CDS/ISIS	39 (25.8)	31 (31.1%)
8	**Application to Circulation services**	45 (37.8)	23 (36.2%)
9	Lending services	49 (40.8)	24 (38.1%)
10	Circulation services	54 (45.0)	19 (30.1%)
11	Charging and Discharging	58 (48.3)	20 (31.7%)
12	Overdue fine	28 (23.3)	25 (39.7%)
13	Overdue notice	34 (28.3)	26 (41.3%)

Table 6 showed frequencies and percentages of librarians on library application software packages used for circulation services in university libraries. Result revealed that some librarians do not have expertise in the use of library application software packages $\overline{X}$ =22.6. Furthermore, respondents showed (37.8%) lack knowledge of specific library application software packages by some librarians such as Tinlib (25.8%), Alice for Windows (25.8%), CDS/ISIS (25.8%), GLAS (26.7%), X-Lib (18.3%) and Greenstone (13.3%) in university libraries. These findings revealed that these software packages were not used to provide circulation services.

While in research institutes librarians do not have knowledge of library software packages such as CDS/ISIS (31.1%) X-Lib (41.3%), Greenstone (31.1%), Tinlib (31.1%), GLAS (20.6%), and Alice for Windows (20.6%). This implied that these software packages were not used to provide overdue notices (41.3%), overdue fines (39.7%), lending services (38.1%), charging and discharging (31.7%) and circulation services (30.1%) in research institute libraries. This result is not surprising because librarians were found to lack knowledge of these software packages for effective services. This agrees with Malik (1996), that software is the most important component of automation process. In line with Haider's (1998), proper awareness of current software is rarely available to Pakistani libraries. This finding confirmed Oketunji's (2001) views that identified the following problems had greatly hampered effective utilization of application software packages. Firstly, most librarians neither have time nor expertise to develop their own application software packages. Secondly, lack of financial resources to support and enhance systems to reflect changes in computer technologies. Thirdly, numerous identical application software packages in other professions like business, corporate and research settings can be selected, customized and used for library services.

Tables 9 displayed constraints in university libraries while those in research institute libraries were presented in table 10.

Table 7: Mean and Standard Deviation of Responses on Constraints that Affect Application of computer technologies to circulation services in University and Research Institute Libraries.

S/No	Items	University Libraries		Research Institute Libraries	
		Mean	SD	Mean	SD
1	Inadequate Computer technology infrastructure	3.07	0.89	2.54	1.03
2	Irregular power supply	3.23	1.07	2.63	1.11
3	Inadequate funding	3.00	1.07	2.73	1.02
4	Inadequate accommodation	2.52	0.99	2.22	1.17
5	Unavailability of computer technology policy document	2.40	1.02	2.08	1.07
6	Librarians inadequate skills in computer technology	2.81	1.23	2.03	1.08
7	Unavailability of computer technology maintenance culture	2.96	1.02	2.05	1.13
8	Outdated computer technology equipment	2.58	1.21	2.03	0.88
9	High cost of accessing Internet	2.27	1.22	2.51	1.22
10	Low Internet bandwidth	2.48	1.04	2.52	0.91
11	Delay payment to host site	2.27	1.04	2.32	0.99
	GRAND Mean	**2.69**	**0.87**	**2.33**	**0.76**

VHE-Very High Extent, HE- High Extent; LE-Little- Extent; NAA-Not At All

Results in table 8 revealed that in applying computer technologies to circulation services, university librarians were constrained by: irregular power supply ($\overline{X}$ =3.23), inadequate computer technology infrastructure ($\overline{X}$ =3.07); inadequate funding ($\overline{X}$ =3.00), unavailability of computer technology maintenance culture ($\overline{X}$ =2.96) and librarian's inadequate skills in computer technology ($\overline{X}$ = 2.81). However, university librarians did not accept: low Internet bandwidth ($\overline{X}$ =2.48), unavailability of computer technology policy document ($\overline{X}$ = 2.40); high cost of accessing Internet ($\overline{X}$ =2.27) and delay payment to host site ($\overline{X}$ =2.27) as constraints that affect application of these technologies in circulation services. Grand mean of $\overline{X}$ =2.69 shows that there are many problems that hindered application of computer technologies and the greatest of these problems was irregular supply of power in university libraries in North-Central, Nigeria.

While research institute libraries revealed that: inadequate funding ($\overline{X}$ =2.73), irregular power supply ($\overline{X}$ =2.63), inadequate computer technology infrastructure ($\overline{X}$ =2.54); low Internet bandwidth ($\overline{X}$ =2.52), high cost of accessing Internet ($\overline{X}$ =2.51) affected application of these technologies in circulation services. While delay of payment to host site ($\overline{X}$ =2.32), inadequate accommodation ($\overline{X}$ =2.22); unavailability of computer technology policy document (($\overline{X}$ =2.08), unavailability of computer technology maintenance culture ($\overline{X}$ =2.05), librarians' inadequate skills in computer technology ($\overline{X}$ =2.03) and outdated computer technology equipment ($\overline{X}$ =2.03) did not affect application of computer technologies in circulation services in research institute libraries. Besides, grand mean of $\overline{X}$ =2.33 revealed that research institute libraries in North Central Nigeria had very few constraining factors on application of computer technologies in circulation services delivery. The greatest of these factors was inadequate funding ($\overline{X}$ =2.73). Despite existing constraints, prospects of computer technology application in circulation services is very crucial. Besides, the meager funds approved which could have been used for the development of libraries including computer technologies according to Ayo (2001) are in some cases diverted to other areas. Sani and Tiamiyu (2005) pointed out that irregular power supply; librarians attitude towards use of these technologies and poor funding were militating towards computer availability and use in Nigerian libraries. Results also confirmed Onilude and Apampa's (2010) findings that the bandwidth available could be inadequate compared to users and this accounts for very low speed of connectivity. Majority of staff require more training in the use of computer for research activities. Infrastructural challenges constitute a major barrier to accessibility of on-line resources which supports research and development.

Tables 8 displayed strategies suggested by librarians in university and institute libraries to enhance application of computer technologies.

Table 8: Mean and standard deviation of responses on strategies used to address constraints that affected application of computer technologies to circulation services in university and institute libraries.

S/No	Items	University Libraries		Research Institute Libraries	
		Mean	SD	Mean	SD
1	Availability of computer technologies for circulation services	3.42	0.81	2.90	1.24
2	Adequate funding for computer technologies	3.37	1.03	2.92	1.19
3	Adequacy of computer technology	3.27	0.91	2.86	1.16
4	Training and retraining of library staff	3.62	0.64	2.73	1.32
5	Regular power supply	3.59	1.02	2.71	1.25
6	Conducive accommodation for computer technology	3.44	0.79	2.89	1.23
7	Regular computer maintenance culture	3.55	0.75	2.60	1.25
8	Competent Librarians in delivery of circulation services	3.56	0.75	2.69	1.24
9	Availability of computer maintenance policy	3.04	0.81	2.54	1.26
10	Provision of current and up-dated computer technology	3.20	0.88	2.79	1.29
11	Access to Internet	3.24	0.79	2.86	1.28
12	Adequate subscription of books through Internet	2.94	1.15	2.62	1.26
13	Adequate subscription of journals through Internet	3.13	1.02	2.52	1.30
14	Use of On-line Public Access Catalogue to access holdings of other libraries	3.51	0.85	2.49	1.30
	GRAND Mean	**3.36**	**0.66**	**2.72**	**1.16**

VA-Very Appropriate; A-Appropriate; LA-Little Appropriate; NA-Not Appropriate

Emerging results from table 8 revealed the followings as appropriate strategies for addressing constraints facing

university libraries: training and retraining of library staff ($\overline{X}$ =3.62), regular power supply ($\overline{X}$ =3.59); competency of librarians in delivery of circulation services ($\overline{X}$ =3.56), regular computer maintenance ($\overline{X}$ =3.55) and use of On-line Public Access Catalogue (OPAC) to access holdings of other libraries ($\overline{X}$ =3.51). These findings showed that these strategies were appropriate for enhancing application of computer technologies in circulation services $\overline{X}$ =3.36. The most appropriate of these strategies was training and retraining of library staff $\overline{X}$ =3.62 in university libraries in North Central Nigeria.

While results revealed the following strategies for research institute libraries: adequate funding for computer technologies ($\overline{X}$ =2.92), availability of computer technologies for circulation services($\overline{X}$ =2.90); conducive accommodation for computer technology ($\overline{X}$ =2.89), adequacy of computer technology ($\overline{X}$ =2.86), access to Internet ($\overline{X}$ =2.86); provision of current and up-dated computer equipment($\overline{X}$ =2.79), training and retraining of library staff ($\overline{X}$ =2.73), regular power supply ($\overline{X}$ =2.71), competency of librarians in the delivery of circulation services ($\overline{X}$ =2.69), adequate subscription of books through Internet($\overline{X}$ =2.62), regular computer maintenance culture ($\overline{X}$ =2.60), availability of computer maintenance policy ($\overline{X}$ =2.54), adequate subscription to journals through Internet ($\overline{X}$ =2.52) while use of On-line Public Access Catalogue (OPAC) to access holdings of other libraries ($\overline{X}$ =2.49) was not appropriate. These strategies were appropriate for enhancing application of these technologies in circulation services $\overline{X}$ =2.72. The most appropriate was found to be adequate funding for computer technology equipment in research institute libraries in North Central Nigeria. Suggested solutions to the constraints of computer application in circulation services were training and retraining of library staff in use of computer technologies, adequate funding for computer technology and availability of these technologies for circulation services. These strategies were given higher rating by those in university libraries, who saw their inadequacy as greater constraint.

Implications of the Study

Findings of this study have implications for librarians, government and management of university and research institute libraries.

Although computer technologies were found to be available in university and research institute libraries in North Central Nigeria that does not translate to high utilization as these technologies were still inadequate. Availability of computer technologies is a pre-requisite for a complete migration from traditional and remote access in libraries to computerized format. This implies that library authorities and management should impress it upon their parent organizations to provide adequate computer technologies and an enabling environment to facilitate and enhance delivery of circulation services by librarians.

Findings also revealed that some librarians were skilled in the use of computer technologies but these skills were not used to collect overdue fines in university libraries in North Central Nigeria. Hence, the impact of computer technologies was still not felt in libraries under study because computer technology knowledge /skills and practice were below average. This implies that library managements should provide avenues for constant training and retraining of librarians through regular and continuous training to be conversant with current computer technologies to avoid obsolescence. It also implies that librarians should not wait for their employers to train them. Rather, they should vigorously pursue continuous training through seminars/workshops and other professional education courses on computer technologies to improve themselves and become relevant in their profession.

University and research institute libraries were found not to have any specific library application software packages for their circulation services. Since software packages were capital intensive and very scarce, it implies that librarians should begin to look inward to write their own programs with the help of programmers to suit context of their routine library services. It also implies that library management should begin to make submission to their parent organizations for needed fund for procurement or development of library software packages for university and research libraries in North Central Nigeria.

Besides, application of computer technologies in circulation services in university and research institutes is still being constrained by inadequate computer technology infrastructure, irregular power supply and inadequate funding. These imply that librarians were still performing circulation services manually and users could not benefit fully from these technologies application in research and developmental activities. This also shows that library managements should request for fund from their parent organizations for the purchase of

modern state-of-the-art equipment.

Suggested strategies to solve the problems discovered in this study include making computers available, providing adequate funding for computer technologies and training and retraining of library staff in the use of computer technologies in university and research institute libraries in North Central Nigeria. This implies that these strategies are possible solutions to constraints that affect application of these technologies in circulation services. It also suggests that these strategies will form a baseline for the formulation of computer technology policy that would be used for provision of circulation services in university and research institute libraries in North Central Nigeria.

Conclusion and Recommendations

The following recommendations are made based on the findings of the study:

1. Library authorities in North-Central Nigeria should ensure that the available computer technologies in university and research institute libraries are regularly serviced, maintained and effectively utilized for circulation services.
2. The library management should ensure that the data provided by computerized circulation system can contribute to effective management of library stock in university and research institute libraries in North-Central Nigeria.
3. Library management should encourage and sponsor librarians to vigorously pursue continuous training through seminars/workshops and other professional education courses on computer technologies in order to improve themselves and become relevant in their profession.
4. Librarians should also be encouraged to look inward in developing their own programs with the help of programmers to suit the context of their routine library services.
5. Library management should address the following constraints: irregular power supply, inadequate computer technology infrastructure and inadequate funding that hinder effective application of computer technologies to circulation services in university and research institute libraries.
6. Library management should also consider the following strategies: training and retraining of library staff in the use of computer technologies, adequate funding for computer technologies equipment and availability of computer technologies for circulation services in university and research institute libraries in North-Central Nigeria.

The application of computer technologies to circulation services in university and research institute libraries in North-Central Nigeria have come to stay. Hence, there should be a radical transformation from manual to electronic method to enable librarians improve the quality of circulation services.

References

Anunobi, C. and Nwabueze, A. (2010) Migrating from the traditional to the digital library environment: Wither Nigerian information professionals, Proceeding of the second Professional Summit on Information Science and Technology. Nsukka: University of Nigeria. 185 191.

Babafemi, G.O. and Adedibu, L.O. (2007) Application of Computer Technology to Circulation Subsystem of the Federal University of Agriculture, Abeokuta. *Nigerbiblios* Vol. 18(1&2)

Brain, J.J. (2007) Shaping our space: Envisioning the new research library. *Journal of Library Administration 46(2), 27 53.*

Ezeani, C.N. and Ekere, J.N. (2009) Use of ICTs by Library Practitioners in Nigeria: Implications for the Library and Information Curriculum. Paper presented at the 14th National Association of Library and Information Science Educators (NALISE

Ezeani, C.N. (2010) Information Communications Technology: An Overview In Madu, C. E and Ezeani, C.N. (Eds.). *Modern Library and Information Science for Information Professionals in Africa*. Ibadan: Textlinks Publishers. 10 31.

Edoka, B. E. (1983). Prospects of Computer-Based Circulation System in Automation in Nigeria University Libraries: Progress of Nigerian University Libraries. *Library & Information Science Review*, 1(2), 109 116.

Edoka, B.E. (2000) *Introduction to Library Science* Onitsha: Palma 133 134.

Nkloma, B.P. (2003) A critical Analysis of library computerization at the copper belt University Zambia. *African Journal of Libraries, Archives and Information Science,* 13(2), 133 153.

Ode, E.O. and Omokaro, D.A. (2007) *Basic principle and practice of librarianship.* Nigeria: PGS-Franc Publication 20.

Ogbonna, I.M. (2003) Academic Libraries in Nigeria: Challenges of ICT in the 21st Century. *The Nigerian Link-Journal of Library and Information Science* 1(1), 116 128.

Oketunji, I. (2000) Application of Information technologies in Nigerian libraries:problems and prospects. In Fayose P.O. & Nwalo K.I.N (Eds) *Information technology in library & Information Science Education*

in Nigeria. Ibadan:National Association of Library and Information Science Educators (NALISE)

Okore, A.M. and Ekere J.N. (2008) Information professionals and knowledge management in library and information services. Paper presented at a National Workshop organized by the National Library of Nigeria held at Abuja.

Olufeagba, B.J. (1977) Computers and Circulation Control. *Nigerian Libraries:* NLA 1/3, 60 80.

Otolo,P.U. and Anie, S.O. Computer (2009) Application to Library Services: Health Hazards and Solutions. *Journal of Library and Information Science (JOLIS)* 3(1/2), 154.

Prytherch, R. (2000) *Harrod's Librarians Glossary of Terms Used in Librarianship, Documentation and the Book Craft and Reference Book*. Aldershot: Gower.

Saadi, M.L. (2002) View from Bangladesh: the new literacy. ACM: Ubiquity magazine forum Available: http//www.acm.org/ ubiquity/views/m-saadi – 1.html. Retrieved September 10, 2010.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar