

**Application of Information and Communication Technology  
in Circulation Operations in Selected Federal  
University Libraries in North Central Nigeria**

**Innocent Sunday Idakwo**  
**Abdullahi Bala Shehu**  
**Fatimah Mohammed Saba**  
**Isyaka Abdullahi Dankwalba**  
*Baze University Abuja*

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**Abstract**

This work is designed to examine the application of Information and communication Technologies (ICTs) in circulation operations in selected Federal University Libraries in North Central, Nigeria. The study was guided by Five research questions in line with the objectives of the study. The design adopted for this study is survey research design and all the circulation staff of University of Ilorin, Federal University Lokoja and University of Abuja made up the population of the study. The population of the three libraries is 12, 9 and 9 circulation staff (Non professional, paraprofessional and professional) respectively. The sample size of the study consists of 30 circulation staff. Data was collected using observation checklist, questionnaire and interview. The data was collected with the use of structured questionnaire from the 30 circulation staff in the university libraries and an observation carried out by the researcher. The entire thirty (30) copies of the questionnaire were correctly filled and returned and were used for this study. Data collected were analyzed using percentage. The results show that ICTs are utilized in circulation operations in the Federal University Libraries; ICT devices are available for circulation operations in the libraries among others. The study recommended that Government should endeavor to provide adequate funds for procurement of ICT facilities for university libraries to enhance automation of circulation operations; the university management should engage the circulation staff on continuous ICT training through organized seminars and workshops; library management and circulation staff should develop maintenance culture as to retain the value of the procured facilities and that the circulation staff should be closely monitored on how they use ICTs in circulation operations to avoid abuse of those facilities.

**KEY WORDS:** *Circulation, ICT, Academic Libraries.*

## **Introduction**

University Library is an academic library which is established and funded by the university to support teaching, learning and research activities of the parent institution. University libraries are those libraries established in institutions of higher learning especially those of universities (Alabi, 2015). University libraries play a central role in the university, their primary responsibility being to assist their patrons in the process of transforming information to knowledge. The librarians in the university coordinate the evaluation and selection of information resources required for the various programs, organizes, maintains and preserves the print and non-print information resources.

According to Omekwu (2006), information growth has been exponential and the concept of information explosion is no longer new to information professionals. However, there are current developments in the professional horizon that impact on professional practice and the emerging roles of librarians in a global environment. Anaeme (2006) opined that rapid expansion of a mass of diversified information is occurring, which has received the name “information explosion”. Thus, the need arose for a scientific approach to information and for elucidation of its characteristics properties, leading to two principal changes in interpretation of the concept of information. One, it was broadened to include information exchange not only between man and man; but also between machine and machine. Ogunsola (2004) explained that the pace of change brought by new technologies has had a significant effect on the way people live, work and play worldwide.

The application of technology in circulation activities is also not a new phenomenon. Libraries are adopting latest technology to manage the different form of information, its communication and increasing use by patrons. The newly derivate technology that is called Information and Communication Technology (ICT) makes tremendous impact on circulation operations, services, users and staff. In broad term, the ICTs application to circulation operations consists of all modern technical means used to make information gets to the library patrons through computer and related hardware, communication networks and necessary software etc. ICT presents an opportunity for circulation librarians to provide value-added information services and access to a wide variety of digital-based information sources of the university libraries to their clients. Libraries and librarians are using modern ICTs to automate their core functions, implement efficient and effective library cooperation and resource sharing through networks. They use ICTs to implement the management information systems (MIS), develop institutional repositories (IR) of digital local content, and carry out Selective Dissemination of Information (SDI) with Current Awareness Services (CAS) to her clients in digital libraries. Libraries are also initiating ICT-based capacity building programmes for their circulation staff and information literacy programmes for library users. However, for most libraries, use of ICTs is largely restricted to traditional library automation, i.e. replacing manual operations by computerized methods (Rana, 2008).

Emuakpor (2002) defines ICTs as all forms of technology applied to the processing, storing and transmitting information in electronic form; stressing that the physical equipment used for this purpose include computers, communication equipment and networks, fax machines and electronic, pocket calculator. Agu (2010) pointed out that the library of today should not merely store documents

and preserve them; it must also devise means by which the contents of such documents can be rapidly and effectively transmitted for use.

This study is focused on selected Federal University Libraries in North Central Nigeria, including: those of Federal University, Lokoja, University of Abuja and University of Ilorin. The Federal University Lokoja was established in 2011. The university has 2 Faculties and 12 academic departments and offers 17 undergraduate programs. The University library actually came into existence in November, 2012 to support the University's objective of teaching, learning and research. The professional Librarians are 15, with 5 Library Officers, 8 Registry Staff and 1 Bursary Staff. That is a total of 29 staff in the library. The library is divided into the following sections namely: Circulation Section, Resource Development Services, Resource Processing Services, E-library/ICT, Reference Service, Reserve Book Unit, Bindery and Serial Section.

The University of Abuja took off from a mini-campus in 1990. The Central Library was opened in August, 2014. It presently serves members of faculty and students that have moved to the Main Campus. They are those in the Faculties of Arts, Science and Management Sciences. The University Library Staff strength is currently sixty two (62) in the following categories: 13 Academic Staff, 11 Para- Professional and other senior supporting Staff, and thirty eight Junior Staff. The University Central Library on the Main Campus along Airport road Abuja is now open for services. Apart from the Central Library, there are also five branch libraries. The Mini Campus Library ceases to be the Main Library in August, 2014 as a result of the Central Library at the Main Campus.

The university library has some of its branches at the faculty levels; Agriculture and Veterinary Library: The Library is in the Faculty of Veterinary Medicine building on the University Main Campus; College of Health Sciences Library. The Library is in the Faculty of Law Complex on the Mini Campus in Gwagwalada.

The University of Ilorin Library system consists of the Main Library at the permanent site, the College of Health Sciences library at University of Ilorin Teaching Hospital at Oke-Oyi and the Law Library situated in the Faculty of Law at the permanent site of the University. The library is organized into five major divisions namely: Administrative Division, Readers services Division, Technical services Division, Automation and Digital Division, Branch libraries Division, Document Section and Student Reference Section.

### **Statement of the Problem**

Application of Information and Communication Technologies to university libraries' operations has yielded much positive results over the years. Circulation unit of university libraries is one area that ICTs have transformed operation. The rigorous processes that the librarians used to undergo in serving the users have been made easier by the use of Information Communication Technologies (ICTs). This has culminated into job efficiency and thereby saving the time of the users.

Considering the benefit of Information Communication Technologies (ICTs) on the area of easy access and retrieval of information, it is important that adequate application of ICTs in circulation operations is given due attention in the university libraries. The extent to which Federal University Libraries in North Central zone of Nigeria have applied Information Communication Technologies

(ICTs) in their circulation operations is unknown. It is equally observed that no research has been carried out on this topic which justified the present study.

### **Objectives of the study**

The main purpose of this study is to determine the application of Information and Communication Technologies (ICT) in circulation operations in selected Federal University Libraries in North Central geopolitical zone of Nigeria. The following are the specific objectives of the study:

1. Identify the circulation operations performed with the use of Information and Communication Technology (ICT) facilities in the selected Federal University Libraries in North Central, Nigeria.
2. Identify the Information and Communication Technology devices used in circulation operations in selected Federal University Libraries in North Central, Nigeria.
3. Ascertain the extent of application of Information Communication Technologies in the circulation operations in the selected Federal University Libraries.
4. Ascertain the constraints encountered in the application of ICT devices in the circulation operations in the selected Federal University Libraries in North Central, Nigeria.
5. Identify strategies for improving the application of Information and Communication Technologies (ICTs) in circulation operations in the selected Federal University in North central Nigeria.

### **Research Questions**

The following research questions were formulated to guide this study:

1. What are the circulation operations performed with the use of Information and Communication Technology (ICT) facilities in the selected Federal University Libraries in North Central, Nigeria?
2. What are the Information and Communication Technology devices used in circulation operations in the selected Federal University Libraries in North Central, Nigeria?
3. What is the extent of application of Information Communication Technologies in the circulation operations in the selected Federal University Libraries?
4. What are the constraints encountered in the application of ICT devices in the circulation operations in the selected Federal University Libraries in North Central, Nigeria?
5. What are the strategies for improving the application of Information and Communication Technologies (ICTs) in circulation operations in the selected Federal University Libraries in North Central, Nigeria?

### **Methodology**

This study adopted descriptive survey research design. The area of the study is North Central geo-political zone of Nigeria. The population is 30 comprising of all the circulation staff in the selected universities within the North Central geo-political zone including University of Abuja, Federal University Lokoja and University of Ilorin. No sampling was done considering the small size of the study population. The instruments used for data collection include questionnaires and observation checklist. Data collected were analyzed using mean, frequency counts and percentages.

**Findings and discussion**

**Table 1: Distribution and return rate of questionnaire by the selected Federal University Libraries in North Central Nigeria.**

University Libraries	Number Distributed	Number Returned	Number Correctly Filled	Percentage Returned
UNIABUJA	9	9	9	30%
UNILORIN	12	12	12	40%
FU-LOKOJA	9	9	9	30%
TOTAL	30	30	30	100%

Table 1 show that UNILORIN has the highest respondents of 12, representing 40% of the total respondents, followed by UNIABUJA and the FU-LOKOJA with 9 respondents each representing the 30% of the population respectively.

**Research Question 1: Which of the following circulation operations is performed in your library?**

**Table 1: Percentage distribution of circulation operations performed by the federal university libraries in north central Nigeria**

S/N	Circulation operations	UNIABUJA		UNI-ILORIN		FU-LOKOJA		AVERAGE	
		Yes %	No %	Yes	No %	Yes %	No %	Yes %	No %
1.	Shelving	9(100)	-	12(100)	-	9(100)	-	30(100)	-
2.	Provision of library cards	9(100)	-	12(100)	-	9(100)	-	30(100)	-
3.	Charging of materials	9(100)	-	12(100)	-	9(100)	-	30(100)	-
4.	Discharging of materials	9(100)	-	12(100)	-	9(100)	-	30(100)	-
5.	Renewing of materials	9(100)	-	12(100)	-	9(100)	-	30(100)	-
6.	Reserving of materials	9(100)	-	12(100)	-	9(100)	-	30(100)	-
7.	Extension of mobile devices	8(89)	1(11)	12(100)	-	8(89)	1(11)	30(93)	2(7)
8.	Inter-library services	8(89)	1(11)	12(100)	-	8(89)	1(11)	28(93)	2(7)
9.	Registration of library users	9(100)	-	12(100)	-	9(100)	-	30(100)	-
10.	Daily statistics records	9(100)	-	12(100)	-	9(100)	-	30(100)	-

11.	Library information resource records	8(89)	1(11)	12(100)	-	9(100)	-	29(96)	1(4)
12.	Library security devices	8(89)	1(11)	11(92)	1(8)	9(100)	-	28(94)	2(6)
13.	Surveillance of information resources	8(89)	1(11)	11(92)	1(8)	8(89)	1(11)	27(90)	3(10)
14.	Writing overdue notices	9(100)	-	12(100)	-	9(100)	-	30(100)	-
15.	Weeding of library materials when necessary	9(100)	-	12(100)	-	9(100)	-	30(100)	-
	Total	8.6(96)	0.4(4)	11.86(99)	0.14(1)	8.8(98)	0.2(2)	29.46(98)	0.66(2)

Table 1 shows that all the items were accepted as circulation operations performed in the university libraries understudy. Shelving of library materials (100%), provision of library cards (100%), charging of library materials (100%), discharging of library materials (100%), renewing of materials (100%), reserving of library resources (100%), weeding of material when necessary (100%), writing overdue notice (100%), surveillance of information resources (89%), extension of mobile devices (89%), library security devices (89%), inter-library services (89%), users' daily statistic record (100%), library information resources statistic records (89%) were among the circulation operations carried out in the libraries understudy. UNIAbuja, UNI-Ilorin and FU-Lokoja had almost the same percentage on their response options. UNIAbuja has 96% response on Yes and 4% on No, UNI-Ilorin has 98% on Yes and 2% on No and FU-Lokoja has 99% on Yes response and 1% on No responses. This implies that all the items listed in table 1 are accepted as circulation operations in the libraries understudy.

**Research Question 2: What are the Information and Communication Technology devices available in circulation operations in selected federal university libraries in North Central, Nigeria?**

**Table 2: Observation check list of available ICT devices used in circulation operations in the university library.**

S/N	ICT ITEMS	ABUJA		ILORIN		LOKOJA		AVERAGE	
		AV	NA	AV	NA	AV	NA	AV	NA
1.	Computers	✓	-	✓	-	✓	-	3	-
2.	Printers	✓	-	✓	-	✓	-	3	-
3.	Scanners	✓	-	✓	-	✓	-	3	-

4.	Photocopiers	✓	-	✓	-	✓	-	3	-
5.	Fax Machine	-	*	-	*	-	*	-	3
6.	CD-ROM technology	✓	-	✓	-	✓	-	3	-
7.	Flash drive	✓	-	✓	-	✓	-	3	-
8.	Projector	✓	-	✓	-	✓	-	3	-
9.	Intercom	-	*	-	*	-	*	-	3
10.	Internet	✓	-	✓	-	✓	-	3	-
11.	External hard disk	✓	-	✓	-	✓	-	3	-
12.	Institutional website	✓	-	✓	-	✓	-	3	-
13.	Digital camera	✓	-	✓	-	✓	-	3	-
14.	CCTV	-	*	-	*	-	*	-	3
15.	Telephone lines	-	*	-	*	-	*	-	3
16.	Library software	✓	-	✓	-	✓	-	3	-
17.	Library e-mail	✓	-	✓	-	-	*	2	1
18.	Video tape player	-	*	-	*	-	*	-	3
19.	Audio tape player	-	*	-	*	-	*	-	3
20.	DVD	✓	-	✓	-	✓	-	3	-
21.	Barcode	✓	-	✓	-	✓	-	3	-
22.	Barcode readers	-	*	-	*	-	*	-	3
	Total		7		7		8	44	22
		15		15		14			

Results in table 2 presents data collected on ICT devices available for circulation operations in Federal University libraries in North Central Nigeria. The analysis revealed that the three selected universities have the following ICT devices; computers, printers, scanners, photocopiers, flash drive, projectors, internet, external hard disk, digital camera, library software, barcode, institutional website and DVD as these items had 3 in their availability rate (AV). It also revealed that circulation unit of UNILORIN and UNIABUJA have Library email while FU-Lokoja has none. Analysis revealed that the three universities circulation units do not have fax machine, intercom, telephone lines, barcode reader, video tape player and audio tape player as such the items had 3 in their non-availability rate. In UNIAbuja and UNI-Ilorin, out of the 22 ICT devices listed, 15 items were available while 7 items were not available. In FU-Lokoja, out of the 22 items listed, 14 items were available while 8 items were not available. This implies that most of the ICT devices are available in these Federal University libraries for circulation operations.

**Research Question 3: To what Extent is ICT applied in circulation operations in the university library?**

**Table 3:** Mean responses on the extent of ICT application in circulation operations in the library

S/N	ITEM STATEMENT	ABUJA		ILORIN		LOKOJA		Average $\bar{X}$	Rnk	Decision
		$\bar{X}$	Rmk	$\bar{X}$	Rmk	$\bar{X}$	Rmk			
1.	Registration of library users	3.22	GE	3.83	VGE	3.00	GE	3.35	1 <sup>st</sup>	<b>Positive</b>
2.	Charging of materials	3.11	GE	3.17	GE	3.44	GE	3.24	2 <sup>nd</sup>	<b>Positive</b>
3.	Discharging of materials	3.11	GE	3.17	GE	3.44	GE	3.24	3 <sup>rd</sup>	<b>Positive</b>
4.	Provision of library cards	3.00	GE	3.08	GE	3.22	GE	3.10	4 <sup>th</sup>	<b>Positive</b>
5.	Renewing of materials	2.78	GE	3.08	GE	3.44	GE	3.10	5 <sup>th</sup>	<b>Positive</b>
6.	Daily statistics records	2.78	GE	3.17	GE	3.00	GE	2.98	6 <sup>th</sup>	<b>Positive</b>
7.	Library information resource records	2.89	GE	3.00	GE	2.89	GE	2.93	7 <sup>th</sup>	<b>Positive</b>
8.	Extension of mobile devices	2.78	GE	3.25	GE	2.33	LIE	2.79	8 <sup>th</sup>	<b>Positive</b>
9.	Library security devices	2.67	GE	3.00	GE	2.67	GE	2.78	9 <sup>th</sup>	<b>Positive</b>
10.	Reserving of materials	2.56	GE	3.08	GE	3.67	VGE	2.77	10 <sup>th</sup>	<b>Positive</b>
11.	Surveillance of information resources	2.44	LIE	3.00	GE	2.78	GE	2.74	11 <sup>th</sup>	<b>Positive</b>
12.	Inter-library services	2.67	GE	3.17	GE	2.22	LIE	2.69	12 <sup>th</sup>	<b>Positive</b>
13.	Shelving	2.00	LIE	1.42	NA	2.56	GE	1.99	13 <sup>th</sup>	<b>Negative</b>
	<b>Grand Mean</b>	<b>2.77</b>	<b>GE</b>	<b>3.03</b>	<b>GE</b>	<b>2.90</b>	<b>GE</b>	<b>2.90</b>		<b>Positive</b>

**Key:** VGE-Very Great Extent, GE- GREAT Extent, LIE – Little Extent, NA-Not at All

Data in table 3 reveal the mean ratings of respondents on the extent of ICT application in circulation operations. The analysis of the data shows that ICTs are to a Great Extent (GE) applied in the following circulation operation in UNIAbuja, UNI-Ilorin and FU-Lokoja libraries. These circulation operations include registration of library users(3.35), charging of library materials(3.24), discharging of materials(3.24), renewal of materials(3.10), provision of library cards for borrowing of materials(3.10), reserving of materials(2.77), library users daily statistic records(2.98), Surveillance of information resources on the shelves(2.74), entrance/exit to the library security devices(2.74) and control of inter-library services(2.69), extension mobile services(2.79), library information resources statistical records(2.93) while ICT were applied in Shelving of library materials(1.99) to a Little Extent(LE). From the analyzed data, it is clear that ICT is applied in circulation operations of the libraries understudy.

**Research Question 4: What are the constraints encountered in the application of ICTs in circulation operations in your library?**

**Table 5: Mean responses of respondents on the constraints encountered in the application of ICTs in circulation operations in the library.**

S/N	ITEM STATEMENT	ABUJA		ILORIN		LOKOJA		Ave rage		Rnk	Dec.
		$\bar{X}$		$\bar{X}$		$\bar{X}$		$\bar{X}$			
1.	Inadequate financial support	3.11	A	3.67	SA	3.56	SA	3.44	1 <sup>st</sup>	Positive	
2.	Erratic power supply	2.89	A	3.35	A	3.56	SA	3.23	2 <sup>nd</sup>	Positive	
3.	Insufficient ICT facilities	3.11	A	3.08	A	3.44	A	3.21	3 <sup>rd</sup>	Positive	
4.	High cost of ICTs	2.89	A	3.17	A	3.56	SA	3.20	4 <sup>th</sup>	Positive	
5.	Lack of infrastructure	2.89	A	3.08	A	3.33	A	3.10	5 <sup>th</sup>	Positive	
6.	Poor maintenance culture	3.00	A	3.17	A	3.11	A	3.09	6 <sup>th</sup>	Positive	
7.	Abuse of facilities by staffs	2.89	A	3.17	A	2.89	A	2.98	7 <sup>th</sup>	Positive	
8.	ICT phobia	3.00	A	3.00	A	2.89	A	2.96	8 <sup>th</sup>	Positive	
9.	Low ICT literacy by staff	2.89	A	3.00	A	2.89	A	2.93	9 <sup>th</sup>	Positive	
	<b>Grand Mean</b>	<b>2.96</b>	<b>A</b>	<b>3.18</b>	<b>A</b>	<b>3.25</b>	<b>A</b>	<b>3.13</b>		<b>Positive</b>	

**Key: SA- Strongly Agree, A- Agree, D-Disagree, SD- Strongly Disagree.**

The result in table 5 shows the mean ratings of the respondents on constraints encountered in the application of ICTs in circulation operation. The respondents agreed (A) that all of the 9 items listed in the above table are constraints to the application of ICTs in circulation operations in UNIAbuja, UNI-Ilorin and FU-Lokoja. Among the constrains that the respondents emphasized include inadequate financial support (3.44), erratic power supply(3.23), insufficient ICT facilities(3.21), high cost of ICTs(3.20), Lack of infrastructure(3.10), Poor maintenance culture (3.09), Abuse of facilities by staff (2.98), ICT phobia(2.96) and lack of ICT literacy by the staff with the mean score of 2.93. Therefore, the entire population accepted that the items above are constraint encountered in the application of ICT in circulation operations in the federal university libraries understudy with the grand mean of 2.96, 3.18 and 3.25 respectively.

**Research Question 5: What are the Strategies for enhancing the application of ICTs in circulation operations in your library?**

**Table 6: Mean responses of respondents on the strategies for enhancing the application of ICTs in circulation operations in the library.**

S/N	ITEM STATEMENT	ABUJA		ILORIN		LOKOJA		Ave rage		Rnk	Dec.
		$\bar{X}$	Rmk	$\bar{X}$	Rmk	$\bar{X}$	Rmk	$\bar{X}$			
1.	Government should provide adequate funds	3.00	A	3.58	VA	3.67	VA	3.42	1 <sup>st</sup>	Positive	
2.	Government should improve power supply	3.11	A	3.08	A	3.67	VA	3.29	2 <sup>nd</sup>	Positive	

3.	Mutual understanding between traditional and ICT skilled librarians	3.11	A	3.08	A	3.56	VA	3.25	3 <sup>rd</sup>	Positive
4.	Provision of adequate infrastructural facilities	3.22	A	3.08	A	3.44	A	3.25	4 <sup>th</sup>	Positive
5.	Adequate provision of ICTs	3.11	A	3.00	A	3.56	VA	3.22	5 <sup>th</sup>	Positive
6.	Improvement in maintenance culture	3.00	A	3.08	A	3.44	A	3.18	6 <sup>th</sup>	Positive
7.	Lib. circulation Staff ICT training	3.00	A	3.17	A	3.33	A	3.17	7 <sup>th</sup>	Positive
8.	In service training	3.00	A	3.17	A	3.33	A	3.17	8 <sup>th</sup>	Positive
9.	Waive tax on ICT facilities to reduce cost	3.00	A	3.08	A	3.33	A	3.14	9 <sup>th</sup>	Positive
<b>Grand Mean</b>		<b>3.06</b>	<b>A</b>	<b>3.15</b>	<b>A</b>	<b>3.48</b>	<b>A</b>	<b>3.23</b>		<b>Positive</b>

**Key:** VA-Very Appropriate, A-Appropriate, FA-Fairly Appropriate, NA-Not Appropriate.

Data in table 6 reveal the mean score of respondents on the strategies for improving the application of ICTs in circulation operations in the selected federal university libraries in North Central, Nigeria. From the analysis, it shows that the entire items in the table were all accepted by the respondents as appropriate strategies that can enhance the application of ICTs in circulation operations. Analysis shows that the major responsibility of improving the application of ICTs in circulation operations rest more on the Government and the university management thus, improved power supply(3.29), provision of adequate funds(3.42), waiving of tax on ICT facilities to reduce the cost(3.14), circulation library staff should be sent for ICT training(3.17), in service training(3.17), library staff should improve on maintenance culture(3.18), Provision of adequate infrastructural facilities(3.25), adequate provision of ICTs and Mutual understanding between traditional and ICT skilled librarians(3.25) were accepted as the appropriate strategies for enhancing ICT applications in circulation operations in the libraries understudy.

#### ***Circulation operations performed with the use of ICTs in federal university library***

The study revealed that the circulation operations performed by the Federal University libraries with the use of ICTs include shelving of library materials, provision of library cards for borrowing materials, charging of materials, discharging of materials, renewing materials, reserving of materials, control inter-library services, registration of library users, library users daily statistic records, library information resources statistic records, entrance/exit to the library security devices and writing overdue notices. The findings agree with Wilson (2012) who admitted that circulation operations in the university libraries include charging of materials to library users; checking in materials returned, charging and receipting overdue fines; send out overdue notices to borrowers, operating automated filing and so on.

### ***Information and Communication Technology devices used in circulation operations in Federal University libraries***

The study further revealed that ICT devices available in Federal University libraries for circulation operation are computers, printers, scanners, photocopiers, flash drive, projectors, internet, external hard disk, digital camera, library software, barcode, institutional website and DVD, library email. It is also revealed that the universities do not have fax machine, intercom, telephone lines, barcode reader, video tape player and audio tape player. In line with the above findings, Anunobi (2005) mentioned that the ICTs available for circulation operations include personal computers, CD-ROM, telefacsimile (fax), network, electro-copying (scanning) and internet.

### ***Extent of ICT application in the circulation operations in the library***

Interview result and data from the questionnaire analyzed shows that ICT is utilized in circulation operations to a great extent especially in the area of registration of library users, charging of materials, renewing of materials, discharging of materials, provision of library cards for borrowing materials, reserving of materials, library users daily statistic records. This findings is related to the findings of Madu and Adeniran (2000) who listed some of the areas that has received the advantages of automated circulation system as follows: charging and discharging of books, writing of overdue notices; and reservation of books and compilation of accession list of new arrivals, recording of fines and keeping of statistics of use of the libraries with the use of computer, these jobs are performed faster, neater and with high level of accuracy. The boredom resulting from repetition routine work is also eliminated.

### ***Constraints encountered in the application of ICTs in circulation operations in the library***

The data generated from interview and the questionnaire shows that constraints to the effective application of ICTs in circulation operation in the library include: inadequate financial support, high cost of ICTs, insufficient ICT facilities, erratic power supply, ICT phobia, poor maintenance culture, lack of infrastructure, low ICT literacy by staff and abuse of facilities. This is in line with Alasa and Kenechukwu (1998) who summarized some of the constrains as follows: Poor and inadequate digital infrastructure, poor level of computer literacy among librarians even among library staff, poor ICT facilities, poor level of awareness of internet facilities and importance of information among Nigerians, ignorance of decision or policy makers on the power of information network on the economic and industrial development of the nation. The researcher is in agreement with the submissions however, he stresses that lack of alternative power supply, lack of training and trained experts on ICT application are the major setbacks in ICT based circulation operations.

### ***Strategies employed to improve the application of ICTs in circulation operations in the library***

The findings from the data reveals that government provision of adequate funds, circulation library staff special ICT training, government improvement on power supply, availability of adequate ICTs, mutual understanding between traditional and ICT skilled librarians, improvement on maintenance culture by library staff, waiving of tax on ICT facilities to reduce the cost, in service training of staff and adequate infrastructural facilities were suggested as measures for improving ICT

application in university library circulation operations. This agrees with Ameen (2010) who emphasized more on Government involvement in providing ICTs amenities for the university libraries which eventually, will improve the application of ICTs in circulation operation.

### **Conclusion and Recommendations**

The application of information and communication technologies into circulation library operations has not brought the end to our libraries, but rather it has exposed us to new and exciting means of carrying out circulation routines in the library. The skills we acquire from them will make us to serve our community of library users more effectively and efficiently.

Based on the findings of the study and their attendant implications, the following recommendations were made.

1. Government should endeavor to provide adequate funds for procurement of ICT facilities for university libraries to enhance automation of circulation operations. This could be carried out in form of government library intervention fund.
2. The university management should engage the circulation library staff in continuous ICT training through organized seminars, workshops and symposia in order to enhance their proficiency on ICT.
3. In house ICT training and knowledge sharing by experienced colleagues in the profession is also required for the development of the entire circulation staff.
4. It is one thing to automate library operations and another thing to maintain it. Therefore, the library management and circulation staff should develop maintenance culture as to retain the value of the procured facilities.
5. The conventional circulation staff should also be closely encouraged on how to use ICTs in circulation operation to avoid misuse of those facilities.

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