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Chinwe V. Anunobi
Nnamdi Azikiwe University, chiinobis@yahoo.com

Benson E. Edoka
University of Nigeria, Nsukka

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Chinwe V. Anunobi Ph.D
Digital Librarian
Nnamdi Azikiwe University
Awka, Nigeria

Benson E. Edoka
Professor
Department of Library and Information Science
University of Nigeria, Nsukka
Nsukka, Nigeria

Introduction

User expectation from any information providing system is to make available directly or remotely and in real time the needed information, format not withstanding. In the university environment, the library a major information providing system supports teaching, learning and research with information materials of various types. Among these diverse information materials, serials are needed especially by faculty and research students. Before the development and use of ICT facilities for capturing/acquisition, processing dissemination and retrieval of information, serials operations were predominantly manual. However with the development of ICT based library service which brought with it self service and simultaneous access to resources (Womboh & Abba 2008), peoples' interest switched from print to electronic information. Furthermore, serials operations in developing countries which was besieged with problems associated with cost (Millis 1992, de Marcas 2000; Aina 2003), inadequate acquisition and processing tools (Szilvassy 1996), competency and accessibility problems (Cohen 1989 and Mullis 1992), embrace the use of ICT facilities as an approach to overcome some of the mentioned problems. This is necessary since according to Ajayi (2003) any industry information or any other which 'sidelines ICT has simply signed a death warrant'

The ICT facilities applied in the library in general and serials unit in particular are based on the functions performed therein. The functions performed in the university serials unit as indicated by Tuttle (1983) are acquisition, processing, public service and preservation. These functions are synonymous with the functions performed in the university library though with some peculiarities emanating from the nature of serials. Therefore ICT facilities used in the broad university library are also applicable to the serials unit but also with peculiarity occasioned by the nature of serials. These services and operations have been transformed using ICT. Aina (2004) informed that there is efficiency in resource organization as delivery and dissemination of information have become effective and easy. Repetitive and routine tasks in the library have been eliminated. Furthermore, the availability of bibliographic database, full text documents and digital library collection is now taken for granted as noted by Chesenga (2004). The IT (ICT) facilities use in the library is defined by the American Library Association (1993) as "the application of computers and other technology to the acquisition, organization, storage, retrieval and dissemination of information. Ifidon (1985) enumerated the functions available for ICT use in the library to include ordering and acquisition with the following activities: ordering, receiving, settlement of invoice and administration of records and expenditure.. Further to that, Oketunji (2001) and Chesenga (2004) listed library functions in

which ICT could be applied to include acquisition, cataloguing, circulation, serials control, selective dissemination of information services and preparation of management information. Furthermore, the application of ICT facilities in the library could be in the stand alone or integrated form.

Many countries and institutions are at varying level of ICT application in their library operation. Islam and Islam (2007) documented the use ICT in libraries in Bangladash and informed that though the use started between 1964 and 1995, progress was not made until 1996. In Nigeria many universities are at the advanced stage of ICT use in library operations. Anunobi and Benard (2007) informed that in their study of ICT availability for library operations in the Imo state of Nigeria only two of the four academic libraries; Federal University of Technology Owerri and Imo State University show evidence of using ICT for library operations. Emorjorho, &Nwalo (2009) found in their study that only very few libraries in the Niger-Delta of Nigeria use ICT in library operations where university libraries have more ICT facilities than the special libraries.Nok(2006) documented the use of ICT in Kashim Ibrahim library, Ahmadu Bello University Zaria while Ekpengong(1997) presented the situation in special libraries in Nigeria. Ani, Esin and Edim(2005) also studied the use of ICT in Nigeria University libraries.

For serials operation, Agbaje (2002:27) informed that "information technology can be an effective hand–maid to serials management at every stage of management process and irrespective of content, use, format and overall strategy adopted for serials management by the organization in question" Akinyotu (1977), Alabi (1985), Oketunji (2001) Agbaje (2002) and Oni (2004) noted that using various approaches, ICT facilities in serials unit can be for the following functions and activities: subscription control, procurement process, order preparation, fund analysis and accounting. They can also be used for bibliographic file control, cataloguing of new serials, preparation of serials record entries and transaction control. Effecting serials additions, changes and deletions or collection control can be performed with ICT facilities. Services and preservation functions such as servicing request for serials publication, binding control file, missing issues, holdings accession of want list as well as union lists are amenable to ICT facilities use. In their findings on the use of computer for library services in Bangladesh, Islam and Islam (2007) discovered that all the libraries surveyed used ICT for serials control as well as other activities. The services provided according to them include CD-ROM searching, online searching, online networking, photocopying, online information services and database searching services. In Nigeria according to Ikem and Ajala (2000), preliminary use of ICT in the library started with its use to produce Union list of Serials sponsored by Committee of University Librarians of Nigeria. That notwithstanding, its continuous use for various serials function is yet to be known.

Statement of the Problem

There are copious studies and opinion on the use of ICT facilities for library functions in general. In Nigerian university libraries, ICT facilities were primarily used for serials functions and are still in use. However not much has been found in literature as regards the areas of serials functions they are used, and the facilities in use. Hence the survey tends to address this gap by identifying the extent of ICT use for serials operations.

Objective of the Study

Specifically, the research was conducted to

- Identify the serials operations performed with ICT facilities in southern Nigerian federal university libraries;
- Determine the serials public services performed with ICT;
- Find out the ICT facilities used for these serials operations;
- Ascertain if the use of ICT facilities in serials unit of the libraries is a determinant to their use for serials operations.

Research Questions

- What serials operations are performed with ICT facilities in southern Nigeria Federal university libraries?
- In which serials public services are the use of ICT employed in Nigerian federal university libraries?
- What ICT facilities are used for these serials operations?
- Does the use of ICT facility in serials units of the libraries under study determine its use for serials operations?

Significance of the Study

The result of this survey will help academic libraries which do not apply ICT facilities for serials functions recognize areas of serials operation in which ICT can be used, and the ICT they can use. With that they can strategize on their use. For libraries using ICT facilities for various operations, they will be acquainted with other areas ICT can be employed in serials operation and the institutions applying such. Donor agencies will also be aware of the state of ICT facilities application in Nigerian university serials operation and decide on the areas to assist such institutions.

Data Collection

The work covered all the federal university libraries in the three of the six geopolitical zones in Nigeria namely South-East (SE), South-West (SW) and South –South (SS). The three zones comprise seventeen states with 13 federal universities. The various zones and their inclusive universities are: South East(SE): University of Nigeria, Nsukka,(UNN), Federal University of Technology Owerri(FUTO), Nnamdi Azikiwe University Awka (NAU), Michael Okpara University of Agriculture Umudike(MOUAU) ; South-South(SS): University of Calabar(UNICAL), University of Port Harcourt(UNIPORT), University of Uyo(UNIUYO); and South West(SW): University of Ibadan(UI), Obafemi Awolowo University Ile-Ife(OAU), University of Lagos(UNILAG),University of Benin(UNIBEN), Federal University of Technology Akure(FUTA), and University of Agriculture, Abeokuta (UNAAB)

Questionnaire and observation checklist were employed to gather facts and opinion of serials staff from 11 of the 13 federal universities libraries. No samples were taken from FUTA and NAU as they had no well developed serials unit at the time of this study. Purposive sampling technique was used to select 55 from the 107 serials staff in the universities under study consisting of five (5) serials staff each including the Serials Librarian and any other four (4) staff which are responsible for acquisition, processing, user services and preservation in the serials units. Self developed questionnaire instrument made up of 5 items were distributed to the 65 staff. Items 1 to 3 of the questionnaire were developed along dichotomous checklist while items 4 and 5 were weighted on four Point Likert-like scales. The observation checklist made up of three (3) observable items was developed to enable the researcher observe serials functions and ICT facilities used in the serials unit of the studied universities.

Answers to the research questions were provided for using tables, percentages, means and graphs. A midpoint mean score of 2.5 that is the average of the individual scores was accepted for items developed on four Point Likert–like scales. A 50 percent positive response was accepted for items analyzed with frequency and percentages.

Results

The result of the analysis are presented to reflect the objectives of the research which include Identifying the serials operations and public services performed with ICT facilities in the universities, identifying the ICT facilities used in the serials units and ascertain if the use of ICT in serials units determines its use for serials operations.

Serials Operations Performed with ICT

The study ascertained through observation in the Serials units of the studied universities functions performed with ICT facilities. The result of the Observation checklist is presented in Table 1. It shows that all serials functions in OAU are performed with ICT facilities; UNAAB and UI have 75 percent of their serials functions performed with ICT. Half of the functions (50 percent) are performed with ICT in UNILAG, UNIBEN, UNICAL, MOUAU and FUTO. UNIUYO and UNN perform only processing and public services serials functions with ICT respectively while none of the functions is performed with ICT at UNIPORT. Considering the 50 percent bench mark for acceptability, only UNIUYO, UNIPORT and UNN do not perform serials functions with ICT. Other libraries do.

Table 1: Observation Checklist on the Various Serials Functions Performed with ICT facilities

S/N	Universities	Serials Functions				Total	percent
		Acquisition	Processing	Public services	Preservation		
1	FUTO	0	0	x	x	2	50
2	MOUAU	0	0	x	x	2	50
3	UNN	0	0	x	0	1	25
4	UNIUYO	0	x	0	0	1	25
5	UNICAL	x	x	0	0	2	50
6	UNIPORT	0	0	0	0	0	0
7	UNIBEN	0	0	x	x	2	50
8	UNILAG	x	0	x	0	2	50
9	UI	x	0	x	x	3	75
10	OAU	x	x	x	x	4	100
11	UNAAB	0	x	x	x	3	75
12	Total	4	4	8	6	21	
13	percent	36.36	36.36	72.72	54.55		

NOTE: x=ICT used; 0= ICT not used

The Table also shows that 54.55 percent and 72.72 percent of the libraries perform serials preservation and public services functions with ICT facilities respectively. A 36.36 percent of the libraries perform acquisition and processing functions with ICT facilities. Hence serials public services and preservations are the major serials functions performed with ICT in the libraries studied considering the 50 percent bench mark.

Serials Public Services Performed with ICT

Again, an observation was made to identify serials public services performed with ICT facilities. The observation checklist is presented in Table 2. The Table shows that UNAAB and MOUAU provide 85.71 percent of their serials public services with ICT facilities. UI had 71.43 percent of the services provided with ICT. A 57.14 percent of such services were provided with ICT at UNILAG, UNICAL and FUTO. Others including UNIUYO (14.29 percent), UNIBEN (28.57 percent) had low use of ICT for serials public services functions. None of the services listed was provided with ICT at UNIPORT.

The percentage of university libraries using ICT facilities for the various serials public services is as shown in the Table reveals that 81.82 percent and 73.73 percent of the studied libraries used ICT

facilities to access serials and article titles respectively. ICT facilities were used to access abstract; index and the retrieval of serials titles by 54.55 percent and 45.45 percent of the libraries respectively. None of the libraries used ICT to access physical serials while 36.35 percent used ICT to retrieve full text of serials. Using a 50 percent benchmark the result implied that those ICT facilities are used for access to abstract, serials and article titles in the universities studied.

Table 2: Observation Checklist on the Various Serials Public services performed with ICT Facilities

S/N	Universities	Serials Public Services							Total	percent
		Access to abstracts	Access to Indexes	Access to Serials title	Access to article titles	Location of physical serials	Retrieval of Serials titles	Retrieval of full text Serials		
1	FUTO	x	x	x	x	0	0	0	4	57.14
2	MOUAU	x	x	x	x	0	x	x	6	85.75
3	UNN	0	0	0	0	0	0	0	0	0
4	UNIUYO	0	0	x	0	0	0	0	1	14.29
5	UNICAL	0	0	x	x	0	x	x	4	57.14
6	UNIPORT	0	0	0	0	0	0	0	0	0
7	UNIBEN	0	0	x	x	0	0	0	2	28.57
8	UNILAG	x	0	x	x	0	0	x	4	57.14
9	UI	x	x	x	x	0	x	0	5	71.43
10	OAU	x	x	x	x	0	x	0	5	71.43
11	UNAAB	x	x	x	x	0	x	x	6	85.75
12	Total	6	5	9	8	0	5	4	37	
13	percent	54.55	45.45	81.82	73.73	0	45.45	36.36		

NOTE: x=ICT used; 0= ICT not used

ICT Facilities Used for Serials Operation in Serials Unit

Answer to the research question on the ICT used for serials operations was found by the Researcher's observation of the use made of ICT facilities in serials units of the various university libraries. The result of the observation is presented in Table 3.The Table shows that only 50 percent of the listed ICT facilities were used in the serials units of UNAAB and UI. UNIBEN, MOUAU and UNILAG used 42.86 percent and 35.71 percent of the facilities respectively. UNICAL and UNIUYO used 28.57 percent and 14.29 percent respectively while UNIPORT, UNN and OAU each used 7.14 percent of the ICT facilities in their serials units. None of the facilities was used at the time of this study in FUTO Serials unit.

Table 3: Observation Checklist on the Various ICT Facilities Use in Serial Unit.

S/N	Universities	ICT FACILITIES														Total	percent
		PC	C	P	S	Fax	CD-R	CDW	CDC	D	E	LAN	W	Int	OP		
1	FUTO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2	MOUAU	x	x	x	0	0	x	0	0	x	0	0	0	0	0	5	35.71
3	UNN	0	x	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4	UNIUYO	x	x	0	0	0	0	0	0	0	0	0	0	0	0	2	14.29
5	UNICAL	x	X	x	0	0	0	0	0	x	0	0	0	0	0	4	28.57
6	UNIPORT	0	x	0	0	0	0	0	0	0	0	0	0	0	0	1	7.14
7	UNIBEN	x	x	0	0	0	x	0	x	0	0	x	0	0	x	6	42.86
8	UNILAG	x	x	0	x	x	x	0	0	0	0	0	0	0	0	5	35.75
9	UI	x	x	0	0	0	x	0	0	x	0	x	0	x	x	7	50.00
10	OAU	0	x	0	0	0	0	0	0	0	0	0	0	0	0	1	7.14
11	UNAAB	x		x	0	0	x	x	0	0	0	x	0	x	x	7	50.00
12	Total	7	8	3	1	1	5	1	1	3	0	3	0	2	3	38	
13	percent	63.63	72.73	27.27	9.09	9.09	45.45	9.09	9.09	27.27	0	27.27	0	18.18	27.27		

NOTE: PC= Personal Computers; C= Copier; P= Printer; S= Scanner; CD-R = CD-ROM; CDW= CD – Writer; D= Diskette; E= E- Mail; LAN=Local Area Network;

Int= Internet; OP= OPAC.

X= ICT Used; 0 = ICT Not Used.

Considering the percentage of the universities using each of the ICT facilities, the result shows that majority of the university libraries (72.73 percent) used photocopier for its serials functions. This was followed by 63.64 percent and 45.45 percent which used personal computers and CD-ROM respectively. Printers, diskettes, LAN and OPAC were each used by (27.27 percent). The Internet (18.18 percent); and scanner, fax machine, CD writer and CD changer (9.09 percent) had very low use in the serials units studied. None of the libraries was using E-Mail and WAN facilities in the serials unit for serials functions. Considering the 50 percent Bench mark, only personal computers and photocopiers were the ICT facilities being used by the Serials units of the studied universities libraries?

ICT Facilities Used in Serials Unit as a Determinant of Its Use for Serials Operations

A cross-tabulation of the result was made to show the percentage serials functions, serials public services and ICT facilities used in various serials units of the individual universities. The result is presented in Table 4.It shows that although OAU had all its serials functions (100 percent) performed with ICT facilities and 71.43 percent of its serials public services performed with ICT; it had very low use of ICT facilities (7.14 percent) in its Serials unit. FUTO which also had 50 percent and 57.14 percent of its serials functions and serials public services performed with ICT respectively had no single ICT facilities in its serials unit. There was also low indication of ICT facilities use in the Serials units of UNILAG (35.71 percent); MOUAU (35.71 percent) and UNICAL (28, 57 percent) despite their average use for serials functions and serials public services. UNN and UNIPORT though do not perform serials functions or public services with ICT had indication of ICT facilities in its serials unit (7. 14 percent). UNIUYO had low ICT facilities use in the Serials unit as well as low use for functions and serials public services. The result implied that the serial functions and serials public services in the Serials units performed with ICT in some cases were not determined by the ICT facilities available in the Serials units of the respective university libraries.

Table 4: Cross Tabulation of percent Serials Functions, Serials Public Services performed with ICT and ICT facilities Used in Serials Units of Southern Nigerian Federal University Libraries

S/N	Universities	percentSerials Functions With ICT	percentSerials Public Services with ICT	percentICT Facilities Used in Serials Unit
1	FUTO	50	57.14	0
2	MOUAU	50	85.71	35.71
3	UNN	0	0	0
4	UNIUYO	25	14.29	14.29
5	UNICAL	50	57.14	28.57
6	UNIPORT	0	0	7.14
7	UNIBEN	50	28.57	42.86
8	UNILAG	50	57.14	35.71
9	UI	75	71.43	50.00
10	OAU	100	71.43	7.14
11	UNAAB	75	85.71	50.00

Discussion of Findings

From the findings, it is apparent that there is a general low use of ICT facilities for serials functions except in the areas of serials public services and preservation (Table 1). This is related to the findings of Siddique (1997) in his work in Saudi Arabia, where only two of seven libraries studied applied ICT in serials control. The low use of ICT facilities for acquisition and processing may be attributed to the non-availability of serials software which will enable the use of ICT for the very complex acquisition and processing activities involved in serials functions. An explanation for this could be found in the works of Anunobi and Benard (2007) where many of the libraries studied do not have library software and those with such were yet to activate their serials module. However, that some libraries like OAU perform all its serials functions with ICT and others like UNN and UNIPORT are not performing any of its functions with ICT shows that there is a great disparity among these libraries with respect to the application of ICT facilities for serials functions especially among the geopolitical zones. The disparity could be attributed to the disposition of these libraries to the major hindrances to ICT application in serials functions. This is also related to the findings of Islam and Islam (2007) that there is disparity in the use of computers and its accessories in library services in Bangladesh.

Furthermore, the increased use of ICT facilities for serials public services reflected in many of these libraries (Table 2); for serials and articles titles access buttresses the fact that these university libraries are providing serials public services with ICT facilities. It also implies that many of them have their automated serials holdings being domicile in personal computers or that they possess the Union List of Serials on CD-ROM which users can access. This is of the same standing with the findings of Tseng *et al* (1990) who noted in his study that 55 percent of the libraries studied have their serials holdings automated. There is also the possibility that some major abstracts like Chemical, Biological, LISA, and AJOL abstracts may be available in these libraries on CD-Rom or Online. Where only the abstract is available, or there is absence of digital library, full text retrieval may not be possible; hence the low university representation on retrieval of full text serials. The responses on ICT facilities use in serials operations still confirms that the libraries studied use little or no ICT facilities in serials functions. This confirmation was derived from the below bench mark for all the facilities outside personal computers and photocopiers (Table 3). The close to 50 percent average score for CD-ROM implies that its use for serials function is becoming prominent. Such is expected since some libraries like MOUAU and UNAAB have the Essential Electronic Agricultural Library (TEEAL) therefore are providing access to serials and article titles using CD-ROM facilities. Again, since the use of Internet and OPAC has low response, there is the

tendency that the serials public services and preservation functions are provided with CD-ROM in these libraries. The use of scanner and fax machine by only one library suggests that the studied libraries were yet to digitize their serials. In addition to that they could be turning to new technology i.e. the Internet in place of fax.

The information presented on the cross-tabulation of percentage serials functions, serials public services and ICT facilities used in serials functions (Table 4) has made series of suggestions. Though some of the University libraries performed serials functions and public services with ICT facilities, they had little or no ICT facilities in their serials units. This is similar to the finding of Anunobi and Nwakwuo (2008) where majority of the university libraries in Eastern Nigeria have not embraced the use of ICT for its operations serials inclusive. This could mean that such functions and services were performed in other units or a designated unit outside the serials units. Observation showed that in most of these libraries that provided serials functions and public services with ICT facilities but with little or no ICT facilities in their serials units have distinct ICT, IT, Systems or Computer centres from which all these functions were performed. The implication of these findings is that the use of ICT facilities for serials functions is gradually disintegrating the compartmentalisation of serials units and other units of the university library. Hence it is likely that in not too long a time, serials functions and public services with the application of ICT facilities could be performed from units outside the serials unit in most of the libraries in southern Nigeria.

The low positive response on the application of the Internet shows that the studied libraries were not utilizing the free electronic serials available on the Internet to augment the limited serials subscription made by some of these libraries. These libraries also deny users the opportunity of using some fee-based serials that are offered freely to developing countries like Nigeria. Such serials include Access to Global Online Research in Agriculture (AGORA); Health International Network Access to Research Initiative (HINARI); Online Access to Research in the Environment (OARE), EBSCOhost, Commonwealth University Documents Online (CUDOS), CAB Abstract etc. If the scenario is not changed, serials users will bypass the library for alternative information providers, thus confirming the conception of Morino (1998) that if libraries do not rise up to the challenges of the technological changes, they will never again be in control of information.

Summary and Conclusion

The following deductions and conclusive evidences are made from the findings of this research:

- Serials functions in the Southern Nigeria federal university libraries are still predominately manually performed with ICT application being more prominent in the public services and preservation functions.
- Public services activities involving the use of ICT facilities are mainly access to and retrieval of serials and articles titles.
- Though a few of the libraries use Internet, LAN and OPAC, photocopiers, personal computer, and CD-ROM are the most commonly used ICT facilities in the serials unit.
- The low availability and use of ICT facilities in serials units of the university libraries is not a determinant of its use for serials operations.Hence many serials operations are performed with ICT facilities outside the serials units.

It is recommended that university libraries should take a firm decision whether to equip serials unit with ICT facilities and affect all serials operations in the unit or have a systems unit where ICT related operations are carried out including serials.University libraries should also solicit aid from donor agencies in the area of ICT hardware and software for serials functions

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