Preservation and Conservation of Electronic Information Resources in Private University Libraries of South-West, Nigeria

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Abstract

This study examined the preservation and conservation of electronic information resources (EIRs) in private university libraries in South – West, Nigeria. Three objectives were examined for the study namely; causes of deterioration of EIRs in private university libraries in South West, Nigeria; techniques for the preservation of EIRs in private university libraries in South – West, Nigeria and the challenges facing the preservation of EIRs in private university libraries in South West, Nigeria. The descriptive survey research design was adopted for the study. Total of (13) private university libraries in South-West Nigeria were selected for the study. A total of 83library staffs were selected. Out of 83 questionnaires distributed, 75 questionnaires were returned and found useful. The study found out that the effect of magnetism, viral attack and natural disaster were to a great extent the causes of deterioration of EIRs, most of the techniques adopted by these private university libraries were refreshing, emulation and technology preservation. Identified challenges to the preservation of EIRs were inadequate funding, lack of trained ICT personnel for preservation process and inadequate ICT infrastructure. Based on the findings the study recommended that Private university libraries must make online subscription to anti–virus software priority, organize constant trainings, allot more funds for the development of EIRs, partner and collaborate with international agencies, and buckle up in the area of disaster preparedness to reduce catastrophic damage and loss of EIRs.

Keywords: Preservation, Conservation, Information Resources, Electronic Information Resources (EIRs), Academic Libraries, Nigeria

INTRODUCTION

In the last few decades, library information resources have received significant changes due to technology–driven applications which marked the most significant development in academic libraries. Thus, the information resources and information service delivery of academic libraries have been revolutionized to electronic or digital formats since print resources are no longer sufficient to cope with the ever – increasing information needs of information seekers. Nwosu, et.al. (2013), the advent of information and communication technology (ICT) has shifted the attention of university libraries to the acquisition of electronic information resources, even though, the printed medium which forms the backbone of libraries are still provided.

Electronic information resources (EIRs), according to Ekwelem, et.al.(2009) are information resources that are available and accessed digitally through computer and computer networks. According to California State University (2005), EIRs encompasses electronic databases, both full text and abstract/citation; e-journals, both individual and collections; e-books; e-article delivery services; etc that can be accessed remotely via the World Wide Web or delivered locally. The composition of electronic information resources makes deterioration inevitable. It is disheartening to note that many academic libraries cannot manage and sustain continued use of these resources. Some libraries do not have working policy on preservation and conservation of electronic information resources and also, most of libraries do not have the technological competence to manage and preserve these resources, and as such, cannot stand the test of time. The nature of EIRs subjects them losses and deterioration due to factors like viral attacks on the software, technological obsolescence over time, effect of magnetism, improper handing by library staff and users, system crash, effect of extreme temperature, relative humidity, etc. Chima & Udo (2015) said the threat to electronic information resources has exerted pressure on educational institutions and their libraries. The pressure on the library and information centres goes beyond sourcing, acquisition, and repackaging and access provision to end users but in preservation and conservation of these resources for sustained usage.

Preservation, according to IFLA principles for the care and handling of library materials (2010) had been described to include all managerial and financial considerations including storage, accommodation provisions, staffing levels, policies, techniques, methods involved in preserving

library and archival materials and the information contained in them. The term conservation, on the other hand, has been defined in the IFLA principles for the care and handling of library materials (2010) as specific practices taken to slow down deterioration and prolong the life span of an object by direct intervening in its physical or chemical make – up. While conservation is direct physical intervention arresting or slowing down deterioration of library materials, preservation involves both direct and indirect action. In preservation, consideration is given to every element that promotes the protection of the materials including the housing, storage system and security against such threats as theft, mutilation and poor handling. However, Varlamoff (2005), noticed that preservation as a collection management strategy had been neglected by Librarians for a very long time in Africa, especially in Nigeria.

In Nigeria, the rate at which information resources deteriorates is alarming. According to Issah (2003) no librarian of today can shy away from the fact that "Information world" stands the imminent risk of losing so much of its valuable written heritage through ever- increasing deterioration of information resources. It must be stressed that the loss of information resources is not limited to print resources alone, but also, electronic information resources. Omeluzor et.al (2012) affirms that private Universities in Nigeria invest heavily in EIRs and Njeze (2012) affirmed that Private University Libraries in South West, Nigeria have a high level of resource deterioration. Therefore, an insight into Preservation and conservation then becomes imperative for sustainability and continued usage of these EIRs.

Statement of the Problem

Studies have shown that Private Universities in Nigeria invest more on EIRs than the Public Universities. Considering the indispensability, importance and huge fund required in setting up EIRs in academic libraries in variance with the alarming records of deterioration in Private University Libraries in South West, Nigeria; a rescue approach needs to be launched. It is disheartening to know that many of these libraries cannot manage or sustain continued use of these resources. Some libraries do not have working policy on preservation and conservation of electronic information resources and also, most of these libraries do not have the technological competence to manage and preserve these resources. It is on this premise that this study seeks to study the preservation and conservation of EIRs in Private University Libraries in South West, Nigeria.

Objectives of the Study

The broad objective of this study is to explore the Preservation and Conservation of Electronic Information Resources in Private University Libraries in South West, Nigeria

i.   examine the causes of deterioration of electronic information resources in private university libraries of South-West, Nigeria;

ii. identify the techniques used in preservation and conservation of electronic information resources in private university libraries of South-West, Nigeria;

iii. determine the challenges facing preservation and conservation practices of electronic information resources in private university libraries of South-West, Nigeria.

Research Questions

Based on the objectives of the study, the following research questions are generated:

i.   What are the causes of deterioration of electronic information resources in private university libraries of South-West, Nigeria?

ii. What are the techniques used in the preservation and conservation of electronic information resources in private university libraries of South-West, Nigeria?

iii. What are the challenges of preservation and conservation practices of electronic information resources in private university libraries of South-West, Nigeria?

Literature Review

Related literature will be reviewed under the following headings: Causes of deterioration of electronic information resources, Techniques for preservation and conservation of electronic information resources and the Challenges facing the preservation and conservation of electronic information resources.

- **Causes of deterioration of electronic information resources**

Adejubee (2012) in Oluwaniyi (2015) said that the greatest enemy of library information resources is the librarian (or archivist) who neglects his/her information resources in the quest for more

efficient management systems. Many users and librarians handling these electronic information resources are mishandling them in terms of touching the reels of CDs, not putting them in their packs and shelves appropriately among others. Hence, the users of electronic information resources should be properly oriented to avoid loss or deterioration of valuable resources in school libraries. Nwosu et.al. (2003) also posited that there was need for libraries and librarians in particular to manage electronic information successfully.

Natural disaster caused by earthquakes, fire, flood or water, are also causes of loss and deterioration of electronic information resources (Iyishu, 2013).Also, Evans (1995) in Iyishu (2013) also explained that non-print materials are particularly sensitive to the effects of ultraviolet light, so videotapes and microforms should never be shelved near a window.

- **Techniques for preservation and conservation of electronic information resources**

Since the way and manner by which EIRs deteriorate differs from other print resources in the library, so also are the techniques and strategies for its preservation and conservation differs. Some of these techniques as identified by Sawant (2014) are explained below: back up, refreshing, emulation, migration, conversion to paper format, preservation metadata, and encapsulation. Back up, as a procedure involves copying and storing contents in multiple locations to create availability and ready replacement of information in the case of failure or other catastrophe of EIRs. Also, refreshing technique is the periodic copying of EIRs to new storage media. It is a short – term preservation technique for copying information to new media before the old media becomes unreadable. Emulation is a strategy for long term preservation of EIRs. Here, old media are mimicked into new media environment. The digital archive will be able to pick the resourcesitself. It is essentially a way of preserving the functionality of and access to digital information which might otherwise be lost due to technological obsolescence. Migration is a set of organized task designed to achieve periodic transfer of digital materials from one hardware/software configuration to another or from one generation of computer technology to a subsequent generation (Sawant, 2006).

Conversion to paper and other format: EIRs can also be converted to paper format through printing, photocopying and scanning again and this hard copy would be kept. This approach is however limited as digital objects become more complex and could contain features that can only be preserved in digital formats.

Preservation metadata is another technique. It is highly useful for long – term preservation of EIRs. Metadata is data associated with objects which relieves the potential users of having to have full knowledge of their characteristics (Sawant, 2006).

Another preservation strategy is encapsulation which involves the grouping together of resources and whatever is necessary to maintain access to it. In contrast to the migration approach, the encapsulation approach retains the record in its original form, but encapsulates it with a set of instruction on how the original should be interpreted. Encapsulation is considered a key element of emulation (Iyishu&Nkanu, 2013).

- **Challenges facing the preservation and conservation of electronic information resource**
  Several scholars like Wamukoga and Mutual (2005) and the National Library of Ausralia (2003),among others in Iyishu&Nkanu (2013), cited the following challenges to the preservation of digital materials viz: technological obsolescence; continuous migration; lack of legislation, policy and strategy; lack of awareness; lack of collaboration and partnership; deterioration of the digital media; disaster planning and recovery.

i.   **Technological obsolescence**: information technology continues to evolve and each new generation of hardware and software tends to displace the previous generation. Sometimes, if digital objects are copied perfectly and transferred to new storage media, it may be impossible to retrieve, render or interpret these objects because of incompatibilities between the systems used to create them originally and the current generation of systems. Consequently, digital preservation requires both maintenance of an accurate signal and the ability to retrieve them for future purpose. Wamukoya & Mutual, 2005 reiterated that it caused the loss of the means of access as a result of the continuous upgrade of operating systems, programming languages, applications and storage media. Such loss of access makes preservation of digital materials meaningless since the main purpose of preserving digital materials is to maintain accessibility ((Lin, Ramiah & Wal, 2003).

ii.   **Continuous Migration:** Another challenge of digital preservation, which arises from the challenge of rapid technological obsolescence, is the need for continuous migration. Migration is a means of overcoming technological obsolescence by transferring digital resources from one hardware/ software generation to the next. According to Rotenberg, (1999), it is an organized task designed to achieve periodic transfer of digital materials from one hardware/software configuration to another or from one generation of computer technology to

a subsequent generation. Migration then becomes a challenge in preservation and conservation of EIRs because the migrated version of a document is never the same as the original resource.

iii. **Lack of legislation, policy and strategy**: According to National library of Australia (2003), as cited by Iyishu&Nkanu (2013), lack of supportive legislation is a major challenge of preservation of digital materials. They stressed further that, internet links bring additional challenge in terms of copyright legislation in that the copyright of software required to access digital files, and the right to copy for preservation has not been adequately articulated in most national legislations.Furtherstill,Wamukoyaand Mutula, 2005 in Oluwaniyi (2015) said that Most African countries do not have a National Information Policy (NIP) which makes the formulation of preservation policies in library and information centers difficult.

iv. **Lack of Awareness about Digital Material Preservation:**

v. The UNESCO draftcharter on the preservation of digital heritage (National Library of Australia, 2003) stressed the need for urgent awareness raising and advocacy in favour of preservation of digital materials. It proposes for the alerting of policy makers and sensitizing the public to both the potential of the digital media and the practicalities of digital preservation

vi. **Lack of Collaboration and Partnership:** Another major challenge of digital preservation is lack of collaboration and partnership among stakeholders, as well as "Lack of clearly assigned responsibilities and resources for the long term preservation" of digital materials (Wamukoya& Mutual, 2005). The UNESCO draft charter on the preservation of digital heritage (National Library of Australia, 2003) also stressed the need for collaboration and partnership on the part of governments, creators, publishers, relevant industries and heritage institutions. According to her, in the face of the current digital divide, it is necessary to reinforce international cooperation and solidarity to enable all countries to ensure creation, dissemination, preservation and continued accessibility of their digital heritage. Industries, publishers and mass communication media are urged to promote and share knowledge and technical expertise.

vii. **Deterioration and Loss of EIRs:** the possibility of digital media getting lost in the event of disasters such as fire, flood, equipment failure, or viral attack and system crash.

viii. **Absence of policy on disaster planning:** The effect of the absence of disaster planning and mitigatory measures results in unnecessary and sometimes, permanent loss of valuable information resources.

ix. **Poor Maintenance culture:** poor maintenance culture, as identified by Popoola (2003) is a major challenge facing African countries generally as they lack maintenance culture. The managements of libraries and archives in Africa have poor maintenance culture of infrastructural facilities such as telephones, electricity, water supply, laboratory equipment, buildings, disaster control devices, computers, etc meant for their preservation and conservation operations. In fact, this factor is responsible for the quick deterioration of EIRs in the library.

x. **Lack of training and retraining on preservation of EIRs:** Ajidahun (2007) in Oluwaniyi, (2015) said that there were professional librarians in the university libraries in Nigeria whose knowledge of library automation has been rendered obsolete owing to lack of training and re-training courses; which development poses challenges to their coping with modern library practices.

Methodology

This study adopted a survey research design. This design allowed for data to be collected. There are 24 Private Universities Libraries in the South-West, Nigeria. A random sampling technique was used to select thirteen (13) private universities in South-West with a population of 83 librarians. Table 1 shows the listof private university libraries in South-West, Nigeria.

Table 1:Private University Libraries

S/N	PRIVATE UNIVERITIES	ACADEMIC LIBRARIANS
1	Caleb University	7
2	Pan AfricanUniversity	7
3	LazOti, BabcockUniversity	12
4	Redeemer University	7

5	Achiever University	4
6	Wesley University	7
7	Joseph Ayo BabalolaUniversity	6
8	OduduwaUniversity	3
9	AjaiCrowderUniversity	5
10	Lead city University	4
11	AfeBabalolaUniversity	12
12	ElizadeUniversity	4
13	Adeleke University	5
	Total	**83**

A structured questionnaire was designed and administered to the librarians in the libraries. 83 questionnaires were administered but only 72 (86%) questionnaires was returned and found useful for data analysis. Data analysis was done using relevant descriptive statistics, (percentage, means and standard deviation)

Data Analysis and Discussion of Findings.

Research question 1: What are the cause of deterioration of EIR in private University Libraries in south west Nigeria?

Table 2: causes of deterioration of EIR

causes of deterioration of digital resources	Non	Little Extent	Moderate Extent	Great Extent	Mean	Std. Deviation
Viral attack	23.0	33.1	29.6	14.3	2.4	1.0

Disaster (fire, flood, earthquake)	22.7	41.8	22.0	13.6	2.3	1.0
Biological agents	14.7	51.1	21.9	12.2	2.3	0.9
Technology obsolescence	23.3	39.4	25.8	11.5	2.3	0.9
Magnetism	30.8	35.1	18.8	15.2	2.2	1.0

Table 2 reveals that of all the identified causes of deterioration ofEIR, magnetism is the least cause of deterioration with a mean score of 2.2 while technological obsolesce, biological agent and disaster has crucial effect on EIR with a mean score of 2.3 respectively. The most profound cause of deterioration on EIR was found to be viral attack with a mean score of 2.4. The spread of mean score shows that nearly all the identified causes of deterioration have little extent of effects on the EIRs. This implies that very little is required by the libraries management to improve the effects of those causes on EIR since their effects are little.

Research question 2: What are the techniques used in preservation and conservation of EIR in private University Libraries in south west Nigeria?

Table 3: techniques used in preservation and conservation of EIR

EIR preservation techniques	Very often	Often	Occasionally	Never	Mean	Std. Deviation
Refreshing (periodic copying from one physical medium to another)	41.4	30.0	15.0	13.7	3.0	0.11
Emulation(preserving the original application program)	38.6	26.8	21.1	13.6	2.9	0.14
Security monitoring against (theft, vandalism and mutilation)	33.6	38.1	16.4	11.9	2.9	0.012
Back up.	30.4	39.2	15.4	15.0	2.9	0.08
Migration (transfer of digital materials from one generation of computer technology to a subsequent generation)	24.9	36.4	23.6	15.1	2.7	0.05

Disaster preparedness against(fire,flood, earthquake etc)	25.4	35.9	8.3	30.4	2.6	0.211
Encapsulation (Creating the original application that was used to create or access the digital object on future computer platforms)	26.7	27.1	19.6	26.7	2.5	0.18
Constant anti-virus update	24.3	18.3	16.5	40.9	2.3	0.22

Table 3 shows that the most common form of preservation techniques among the libraries was refreshing, which refers to periodic copying from one physical medium to another with a mean score of 3.0. Other forms of technology preservation, emulation and security monitoring with a mean of 2.9 each, migration 2.7, disaster preparedness 2.6, encapsulation, 2.5 and antivirus update 2.6. in a similar research by Sawant, S. (2014) on preservation and conservation practices in academic libraries, It was found that refreshing (39.1%) was the most commonly followed preservation method. It was also observed that occasionally libraries do migration (70.6%) followed by technology preservation (64.7%). It also was observed that 81.7% libraries never do microfilming and 17 libraries did not follow any of the digital preservation techniques. Two respondents commented in others that they backed up information on CD-ROMs everyday

Research question 3: Challenges facing conservation and preservation of EIR in private University Libraries in south west Nigeria?

Table 4: Challenges of preservation of EIR.

Challenges of preservation and conservation of EIR.	SA	A	D	SD	Not Sure	Mean	Std. Deviation
Lack of legislation, policy and strategy	35.7	33.6	6.1	7.6	17.0	3.6	1.5
Funding	35.0	27.7	7.3	11.3	18.6	3.5	1.6
Lack of qualified ICT personnel.	34.4	23.0	11.5	5.9	25.2	3.4	1.6
Inadequate ICT infrastructure including Computer hardware and	33.0	30.1	6.5	7.6	22.8	3.4	1.6

software and bandwidth/access							

Table 4 shows that lack of legislation, policy and strategy is the greatest challenge facing preservation of EIR with a mean score of 3.6, this view is in tandem with Iyishu&Nkanu (2013), who cited lack of legislation, policy and strategy as one of the challenges to the preservation of digital materials. funding rated next with a mean score of 3.4 and inadequate ICT infrastructure and qualified ICT personnel are also crucial challenges facing preservation of EIR with a mean score of 3.4 each.

From above analysis of this study, lack of legislation, policy and strategy was the greatest challenge facing the preservation and conservation of electronic information resources followed by inadequate funding and then lack of ICT personnel and lastly, inadequate ICT infrastructure. Library management should look into these identified challenges as the mean result shown is above average benchmark.

Conclusion

The causes of deterioration, techniques for preservation and challenges of preservation of EIRS in private university libraries in South West, Nigeria had been discussed through this research work. Effect of magnetism, viral attack and disaster such as fire, flood or water were to a great extent the causes of deterioration of EIRs while biological agents and technological obsolescence were moderate causers of deterioration in private university libraries in South West, Nigeria.

On the techniques adopted by private university libraries in preservation of EIRs, refreshing was the highest, followed by emulation, technology preservation and security measures against theft and vandalism respectively, followed by migration and disaster preparedness, then, encapsulation and the least technique adopted was constant anti – virus update.

Some of the challenges facing preservation and conservation of EIRs in private University libraries were also identified to be lack of legislation, policy and strategy, inadequate ICT infrastructure and lack of ICT personnel to handle preservation and conservation.

It is therefore not an understatement that private university libraries are faced with certain challenges in the quest for preservation for sustainability.

Recommendations

Based on the findings of this research work, the following recommendations are made:

i.   Private university libraries must make online subscription to anti – virus software for constant scanning of their computer systems;

ii. There should be constant trainings on the handling and preservation of the libraries' EIRs;

iii. Private university management should allot more funds for the development of EIRs in their libraries. Not only this, they can also partner and collaborate with international agencies who can assist in the area of funding;

iv. Private university library management should buckle up the more in case of disaster preparedness to reduce catastrophic damage and loss of EIRs.

v.   EIRs like CDs, Computer programs housing databases must be placed far away from direct rays of sunlight.

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