

Preservation and Conservation of Library Resources in Nigerian Libraries: A Review

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ABSTRACT

Libraries in its quest for acquiring resources should bear in mind that there will be a need for the resources to be preserved for its effective use. Therefore, library resources preservation and conservation is one of the major functions of the library. This paper tends to review preservation and conservation of library resources in Nigeria. The paper discusses the concept of library resources as those materials, both print and non-print found in educational libraries which support curriculum and personal information needs. It also discusses damages to library resources, which includes the cause of deterioration of library resources such as internal or inherent vices and external agents. The paper equally talks about the main issues in preservation and conservation of library resources, in which preservation is seen as an activity in the library that encompasses all actions taken by the library or library staff to ensure the prolongation of life of resources kept in the library. Conservation on the other hand is a direct method of treatment in which an item is physically or chemically changed. The paper also outlines the challenges facing preservation and conservation of print library resources and techniques for preservation and conservation of library resources. Digital preservation of library resources were also discussed, including concept of digital preservation, objective of digital preservation, requirement of digital preservation, digitalization equipment and digital preservation techniques. The paper concludes that libraries should not only strive to acquire resources, but should ensure that the resources acquired are preserved and conserved in a usable condition for generations of users.

Keywords: Preservation, Conservation, Library, Resources, Digital, Acquisition

I. INTRODUCTION

The beauty of libraries housing intellectual materials, which are printed and non-printed, is exhibited when it stands the test of time and satisfies the needs of users. Preservation and conservation of library resources all over the world today is one of the major functions of the library. Libraries acquire these resources regularly and also should be able to make provision for its safety.

As a matter of fact, this has been a serious concern on the libraries on the materials entrusted in their care. Preservation and conservation are two terms that are interwoven although with slight differences. They go side by side to achieve the objectives of the library on proper handling of library resources. Preservation is seen as the task of minimizing or reducing the physical and chemical deterioration of documents, while conservation is the maintenance of documents in a usable condition through treatment and repairs of individual items to slow the process of decay or to restore them to a usable state (Alex-Nmecha & Owate, 2019).

However, Popoola, (2003), Alegbeleye (2008) and Walker (2013) assert that deterioration of library information resources is one of the basic challenges facing library materials which are prone to wear and tear, shrinkage, cracks, brittleness, warping, bio-infestation, discoloration, abrasion, hole, dust and dirt accumulation. The external causes of deterioration of collections include poor handling or storage, theft or vandalism, fire and flood, pests, pollution, light and incorrect temperature and relative humidity. Therefore, the need to preserve and conserve the library resources is very crucial for effective impartation of knowledge to library users. Preservation and conservation of library resources enhances and contributes to the achievement of information literacy when users do not face hindrances in accessing the resources using the skills and expertise they have through the gadgets that are in good condition. Librarians who are custodians of library resources should master various ways of preserving and conserving library resources.

For the better understanding of preservation and conservation of library resources, the concept of library resources must be established and discussed. Hence, this chapter starts with the concept of library resources.

II. CONCEPT OF LIBRARY RESOURCES

Today's libraries are repositories and access points to print, audio, and visual materials in numerous formats, including maps, prints, documents, microform (microform/microfiche), CDs, cassettes, videotapes, DVDs, videogames, e-books, audio books (microfilm/microfiche), and many other electronic resources. Libraries often provide facilities to access their electronic resources and the Internet. Modern libraries are increasingly being redefined as places to get unrestricted access to information in many formats and from many sources. They are extending services beyond the physical walls of a building, by providing material accessible by electronic means, and by providing the assistance of librarians in navigating and analyzing tremendous amounts of information with a variety of digital tools. Because they serve such a diverse range of people, libraries maintain collections that can span the spectrum of human knowledge and opinions. Collections include printed materials such as reference sets, paperback novels, biographies, children and young adult literature, histories, newspapers, and magazines. They usually also contain photographs, maps, art reproductions, sound recordings, and video recordings. In addition to print and audiovisual materials, library collections include computer workstations with software, CD-ROMs, and connections to information worldwide through the Internet.

Library resources can be referred to as those materials, both print and non-print, found in educational libraries which support curricular and personal information needs. Print items include books, magazines, newspapers, pamphlets, microfiche or microfilm while non-print materials include films, disc records, filmstrips, slides, prints, audiotapes, videotapes, compact discs, and computer software. They are also resources acquired by the library for the use of library patrons, the resources could be printed or non-printed resources. They can equally be regarded basically as sources of information, which are mostly books, journals, newspapers and other editorials, and encyclopedias. But with the advent of the internet, digital sources of information have become prevalent, these digital sources of information include, but not limited to, online libraries and journals, online encyclopedias like the wikipedia, blogs, video logs like the youtube, etc.

According to Olatokun (2008), libraries acquire resources to meet the informational or recreational needs of its clientele. When the resources in one's care is allowed to deteriorate unchecked or become damaged in anyway, it may be difficult and may be ultimately difficult for the information it embodies to be used. It is the responsibility of the library staff to keep these materials in good physical condition so that they are available for users at all times. In the view of

Maravilla (2008), librarians the world over are tasked with the responsibility of acquiring, processing, disseminating information to users; and due to constant exposure of clients to these materials the rate of degradation increases. Every library is prone to two kinds of deterioration: biological deterioration caused by insects' attack and fungi growth or environmental deterioration caused by extreme dampness, wide fluctuations of relative humidity, variations in temperatures, light and atmospheric pollutants. It should be noted that reputable, unbiased, professionally prepared selection aids should as well be consulted as guides for the acquisition and selection of library resources.

III. DAMAGES TO LIBRARY RESOURCES

The fundamental factor in minimizing unnecessary damage to the library material also depends on the careful handling of the materials on the part of both staff and reader. Books should never be pulled off the shelves by head caps. When more than four to five books have to be carried within the library, care should be taken to reduce the possibility of dropping off the books. Over-sized books should be handled with great care and books should not be jammed on overcrowded shelves that may cause damage to binding (Kneale, 2000; Ovowoh and Iwhiwhu, 2010).

Edhebe (2004) stated that much avoidable damage is done to books by well-meaning but untrained librarians through the following:

1. the use of pressure sensitive tapes on library materials.
2. Indeterminate use of polyvinyl acetate and other synthetic adhesives.
3. Use of highly acid paper for protective wrappers.
4. Use of wood backing in print, picture and map frames.
5. Amateur lamination.
6. Improper storage.

The causes of Deterioration of Library Resources

As regards to the causes of deterioration of library resources, Iyishu, Nkanu & Ogar (2013) explained that library resources deteriorate as a result of Internal or inherent vices and External agents of deterioration.

- **The Internal or Inherent Vices**

Internal or inherent vices are caused by weakness in the chemical or physical make-up of an object introduced during its manufacture. Early paper was made from clean lines, cotton, flax and strong fibers. It was not treated with bleaching agents and was not sized with rosin and alum. This type of paper was permanent, durable and was chemically and physically strong enough to endure the wear and tear of the ages. Modern paper (paper produced since the 19th century) has wood pulp as its basic raw materials instead of cotton and line rages. The wood pulp is bleached with chlorine and the paper sized with alum and rosin. This makes the paper acidic, thereby placing the paper in a low PH condition. PH is a symbol used to signify the degree of acidity or alkalinity of any organic material.

- **External Agent**

The external agents can be classified as:

- a. Biological causes
- b. Environmental causes
- c. Chemical causes
- d. Mechanical causes

Biological Causes: Mold, mildew can cause a serious and most often irreparable damage to paper materials. The most common species affecting library and archives materials are silverfish, bookworms, booklice and cockroaches. Most insects are not attracted to the paper, but rather to sizing, adhesives and starches that are dark, wet, dirty, clustered and undisturbed. Mold and mildew are types of fungi, microorganisms that depend on other organisms for sustenance. Molds excrete enzymes that allow them to digest organic materials such as paper and book bindings, altering and weakening those materials. A clean, well-ventilated and climate-controlled environment goes a long way toward preventing infestation by any of these pests.

Environmental Causes: Researches indicate that cooler temperatures are preferred for library materials. According to Library of Congress preservation recommendations, an ideal environment for books is 550F storage areas. Mixed use storage areas should be kept at 700F. If library materials are stored separately from use areas, the temperature can be brought down further to 650F or less. Uncontrolled humidity levels can cause mechanical damage. If conditions are too humid, the material will swell and warp, resulting in cockling and other physical distortions. These dimensional changes weaken physical bonds and set up stresses that can shorten the life of most

materials. If conditions are too dry, materials will become brittle and more susceptible to cracking, particularly during handling. Light is very vital in the provision of library services since materials have to be identified and read. On the other hand, it is one of the greatest enemies of library materials, especially paper. Non-print materials are particularly sensitive to the effects of ultraviolet light, so videotapes and microforms should never be shelved near a window.

Chemical Causes: Airborne contaminants in the form of gases and particulates can jeopardize the preservation of library materials. Gaseous pollutants can originate indoors from photocopiers, painting, cleaning supplies, untreated wood and certain kinds of adhesives and plastics. Particulate pollution is also a great concern, as it comes in the form of tiny solid substance from smoke, dust and vehicle engines. The library should be fully air-conditioned, air conditioners are highly recommended for books. Air conditioners help in stabilizing the temperature and humidity for libraries. They also help to filter out particulates and chemical pollutants.

Mechanical Causes: Mechanical damage to library materials includes the human factor and natural disaster. Archives and libraries are prone to disasters that can be classified broadly as natural and man-made. Natural damage to materials can be caused by earthquakes, fire, flood or water, while human factors include careless handling, vandalism and improper support during storage.

IV. PRESERVATION AND CONSERVATION OF LIBRARY RESOURCES

Preservation is an activity in the library that encompasses all actions taken by the librarians/library staff to ensure the prolongation of life of resources kept in the library. These library resources include media, non-book, and printed materials. The media materials are computer, hard-drive, databases, and library software. Non-book materials include CDROMs, audio and video tape, while printed materials are pictures, magazines, books, maps etc.; these materials put together are to achieve a purpose, the purpose being to educate users and build literacy into them. And so they (the library materials) are to be preserved (Alex-Nmecha & Owate, 2019).

Preservation is referred to all those library activities and measures intended at conserving library materials for posterity. In supporting the above statement, Lakshminarasimhappa & Veena (2014) stated that preservation is a part of conservation, which is concerned with problems like repair, dusting, fumigation, de-acidification, air-conditioning, lamination, binding, and storage of

manuscripts, books, films, disks, and optical materials. Preservation is also an indirect method of treatment in which the environment around an item is changed. This includes stabilizing, maintaining and monitoring temperature, humidity, light exposure, air pollution, dirt, dust and mold (Murray, 2005). Preservation includes surveying the proper storage and handling techniques, security, including theft, vandalism, disaster prevention, education, training, and out- reach programs for staff, patrons, clients, and the public.

Conservation on the other hand, is a direct method of treatment in which an item is physically or chemically changed. This includes cleaning, repairing, rebinding and reformatting. All conservation treatments entail the least intrusive methods possible and use of acid-neutral materials. According to Alex-Nmecha & Owate (2019), conservation is the repair treatment and a restoration of information materials. To them, both preservation and conservation are important functions of the libraries since they point at prolonging the life and use of materials, and the rate at which these library materials are given a pride of place determines the rate at which information literacy is boosted and fostered.

Conservation includes study, diagnosis, preventive care, examination, treatment, documentation using methods that may prove effective in keeping that property close to its original condition, and for as long as possible. The conservation actions are carried out for a variety of reasons including aesthetic choices, stabilization, needs for structural integrity or for cultural requirements for intangible continuity. The activity of one leads to the other i.e. the preservation of library materials leads to the conservation of materials. Alegbeleye (2002) clearly states that there are few misconceptions in the use of preservation and conservation. He explains that the terms' preservation and conservation are used interchangeably. But strictly speaking experts in the field draw a distinction between the two words. Preservation includes all the managerial and financial considerations, including storage and accommodation provisions, staffing levels, policies, techniques, and methods involved in preserving library and archival materials and information contained in them, while conservation refers to specific practices taken to slow deterioration and prolong the life of an object by directly intervening in its physical or chemical make-up.

However, the following are the itemized methods of preservation and conservation of library resources, which have been mentioned earlier:

- Binding

- Encapsulation
- Photocopying
- Digitization
- De-acidification
- Cleaning and dusting
- Shelving library materials to allow for free flow of air
- Use of insecticide and insect repellent for library materials techniques
- Installing air – conditioners in your library
- Provision of adequate security system to prevent theft mutilation and defacing of paper-based materials

The deterioration of library materials forms the basic problem of libraries and given rise to preservation and conservation needs. In the course of preserving materials, there is a need to adequately consider the value of records in terms of its educational, socio-political and economic impact on society, and decide the period during which each class of documents might be kept for use and then destroyed or permanently preserved for future use. However, no library material is infinite. By their very nature, they are susceptible to deterioration, hence preserving and conserving them become ultra-important. In order to retain the information contained in all media of communication for effective use by future generations, there is the need to preserve, conserve or affect both activities on the resources (Iyishu, Nkanu & Ogar, 2013).

They further stated that there is a need to preserve titles which have arte-actual, biographical or intellectual values as it is instructive to note that paper deteriorates very fast because of their ephemeral nature. Machine-made paper is made of wood, pulp containing harmful acids that cause it to deteriorate fast. Materials used for binding also contain harmful ingredients that cause deterioration. Environmental factors like high temperature and relative humidity, exposure to light, air pollution, and careless handling by increasing the number of users in open access repositories, cause deterioration and object damage to materials that are very valuable.

V. CHALLENGES FACING PRESERVATION AND CONSERVATION OF PRINT LIBRARY RESOURCES

According to Kaur (2017) and Ambika & Begun (2017), the following are the problems or challenges libraries faced in the preservation and conservation of library resources:

- Lack of training to the existing library personnel.
- Severe environmental conditions around library environs.
- Lack of suitable and appropriate equipment and facilities for preservation and conservation of library resources
- Shortage of library staff and skilled manpower in library resources' preservation activities.
- Lack of effective sanctions among librarians who go damages library resources.
- Little awareness of the importance of preservation and conservation among library staff.
- Inadequate infrastructure in the library for preservation and conservation of library resources.
- Lack of library committee or management initiative as regards to preservation and conservation of library resources.
- Lack of written policy on preservation and conservation of library resources.
- Frequent power failure
- Inadequate funding of the library by the management concerned.

VI. TECHNIQUES FOR PRESERVATION AND CONSERVATION OF LIBRARY RESOURCES

In spite of the challenges in preservation and conservation of print library resources, Kaur (2017) and Ambika & Begun (2017) outlined possible techniques for preservation and conservation of library resources. Such techniques are as follows:

1. Implementation of preservation and conservation techniques of library resources.
2. Formulation of proper conservation or preservation policy.
3. Shelving of library resources to allow for a free flow of air
4. Provision of adequate security to prevent theft, mutilation and defacing of paper-based materials.
5. The use of insecticide and insect repellent for library materials preservation.

6. Installing of air-conditioners in the library.
7. In case of any natural calamities like fire, flood, etc. there should be a written plan in preventing such occurrence.
8. In every library there should be fire detection and suppression system installed.
9. In the library budget there should be proper provision of allocation of amount for the preservation and conservation of library heritage.
10. The library should find out the cause of deteriorating of print or digital material in order to take an appropriate measure in curtailing it.
11. Workshops should be conducted and different training courses should be done for librarians and library staff for the purpose of preserving and conserving library material in different ways.
12. Libraries should be equipped with lamination machines, binding tools, microfilming equipment, photocopying and other necessary equipment for the preservation and conservation of library resources.
13. There should be a proper and constant cleaning and dusting of library materials.
14. Training should be given to librarians on how to operate different equipment such as microfilm cameras, fire extinguishers, scanners, etc.

VII. DIGITAL PRESERVATION OF LIBRARY RESOURCES

Digital Preservation

Digital preservation encompasses a broad range of activities designed to extend the usable life of machine readable computer files and protects them from media failure, physical loss and obsolescence. It is a process by which digital data is perceived in digital form in order to ensure the usability, durability and intellectual integrity of the information contained therein. It is as well the storage, maintenance and accessibility of a digital material over a long term, usually as a consequence of applying one or more digital preservation strategies. These strategies may include technology preservation, technology emulation, or data migration. Digital preservation means taking steps to ensure the longevity of the electronic document in terms of the following.

- Data (this might be for text, image, video or audio stored in a variety of format and standards)
- An index to the data
- Link to other databases

- Metadata
- Software (relies upon hardware and Operating System)
- Storage medium (Lakshinarasimhappa & Veena, (2014).

They further discussed the objectives of digital preservation, requirements of digital preservation and digitization equipment, which have been thoroughly explained below.

Objectives of Digital Preservation

The main ground of digital preservation is to achieve the following objectives:

- Providing continued access to digital material for both born digital and digitized material.
- Ensuring authenticity of preserved digital material.
- Preserve physical media to avoid damage/ deterioration by ensuring environmental control.
- Changing the digital information in to newer and fresher format, if it is necessary.
- Achieving co-ordination of all efforts that are undertaken for preservation globally in order to achieve more synergy, to avoid redundancy and reduce cost. This provides an effective infrastructure for collaboration by connecting different networks, institutions and individuals that are working in this field.
- Focus the stakeholders on issues that desperately need attention in this area. The basic assumption being that action has to be taken at the outset rather than at secondary stages.

The Requirements of Digital Preservation

Digital preservation requirements depend on the type, size and amount of data, and also on the goals of each organization, regarding the reuse of data. However, there are several generic and common requirements that can be surveyed, based on what someone in the future would require from information stored today. The digital preservation requirements are as follows:

1. **Reliability requirement:** A digital preservation system must be designed to store data indefinitely without suffering any data losses. It requires that a copy (or preservation) of any preserved digital object survives over the system's lifetime, which usually unknown, but may be as long as decades or even centuries.
2. **Authenticity requirement:** the authenticity assurance of a digital object, which is already a common requirement for tangible object is required. As a result a future consumer should be able

to decide if the accessed information is sufficiently trustworthy. It is crucial to assure the integrity of digital objects, guaranteeing that their informational content was not modified.

3. Technological content requirement: Digital Preservation requires that future consumers are able to obtain the preserved information as its creators intended, dealing with obsolescence threats. This requirement encloses several challenges, since a digital object, to be explored, requires a technological context defined by specific software and, in some cases, even by specific hardware.

4. Technical scalability requirement: Dynamic collection and environments for digital preservation require technical scalability to face technology evolution, allowing the addition of new components through incremental updates.

Digitization Equipment

There are some digital equipment used in digital preservation of library resources, and they are required based on the available documents which are going to be digitized. The following are some of the equipment:

- Wide format scanner which can scan document width to up to 42 inches
- Digital Cameras
- Scanners
- Book scanners with V shaped cradle
- Dark rooms with lighting equipment
- Servers: IBM server with an installed storage of 20TB, Scalable up to 48TB
- Backup equipment: LTOP Tap drives, hard drivers, DVD writers.
- Computers: Desktop and Laptops

Several authors and institutions, respectively, such as Lin, Ramah and Wal (2003), Caplan (2004), Wamukoga and Mutula (2005) and the National Library of Australia (2003), have cited the following challenges to the preservation of digital resources:

- **Technological Obsolescence**

According to Caplan (2004), markets are full of a variety of digital formats that continually change from time to time with some formats getting obsolete. The format obsolescence is complemented by rapid hardware and software obsolescence, which is a significant threat to digital preservation, as it causes the loss of the means of access (Wamukoga and Mutula, 2005).

- **Continuous Migration**

The need for continuous migration is another challenge of digital preservation, which arises from the challenge of rapid technological obsolescence. National Library of Australia (2003) report that migration is a means of overcoming technological obsolescence by transferring digital resources from one hardware/software generation to the next. The purpose of migration is to preserve the intellectual content of digital objects and to retain the ability for clients to retrieve, display, and otherwise use them in the face of constantly changing technology.

- **Lack of Legislation, Policy and Strategy**

Lack of supportive legislation is a major challenge of preservation of digital materials. Besides, since legislators are usually neither aware nor conversant with the requirements of digital preservation, they make laws that either ignore or inadequately cover digital preservation issues (Wamukoya & Mutula, 2005). An additional challenge is that digital evolution has been too rapid and costly for governments and institutions to develop timely and informed preservation strategies.

- **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 & Mutula, 2005). Such absence of collaboration and partnership exists among governments, creators, publishers, relevant industries and heritage institutions. There is also need for partnerships between archivists, information technology personnel, system analysts, record managers, and other information management staff to come up with holistic strategies on how to deal with digital preservation issues (Lin, Ramiah and Wal, 2003).

- **Deterioration of the Digital Media**

Deterioration of the digital media is one of the challenges of digital preservation, which is becoming a cause for the disappearance or inaccessibility of digital information as the media usually deteriorate within a few years or decades at most. Another challenge to digital preservation is the possibility of a digital media getting lost in the event of disasters such as fire, flood, equipment failure, or virus attack.

- **Disaster Planning and Recovery**

The other challenge is lack of disaster planning and mitigation strategies for digital materials at institutional, as well as national levels. The effect of the absence of disaster planning

and mitigatory measures results in unnecessary and sometimes, permanent loss of valuable information resources.

Digital Preservation Techniques

Ambika & Begun (2017) conducted a research on problems and challenges in preservation and conservation of law Colleges library resources in Karnataka: A study in which they outlined the digital preservation techniques as follows:

- Refreshing: this is periodical copying from one physical medium to another.
- Technology preservation i.e. replicating any old configuration of hardware and software.
- Migration, which is the transfer of digital materials from one generation of computer technology to a subsequent generation.
- Emulation, which is the preservation of the original application program.
- Encapsulation: this is creating the original application that was used to create or access the digital object on future computer platforms.

VIII. CONCLUSION

Libraries should not only strive to acquire resources, but should ensure that the resources acquired are preserved and conserved in a usable condition for generations of users. Libraries should be air-conditioned as its importance to library materials cannot be over-emphasized. Though damage to library resources are sometimes unavoidable, but with careful preventive measures, deterioration of the materials may be lessened or prevented. Library resources are the heart of libraries and should be well preserved and conserved as they are vital access to learning and information. Every library, large or small, should have a well-defined programme for preserving the materials which it houses and in planning for preventive preservation, users and library staff should be aware of their roles in the preservation programme.

Having seen preservation and conservation in a pervasive sense and having observed the need for policies to be designed in order to maintain a reasonable level of standardization that will compare with what is obtainable universally, it is imperative to mention that in preserving media materials/ records, it is important to keep them under conducive conditions devoid of dust. It should be ensured that they are properly cleaned and taken care of. Media resources should be prevented from water which can soak books and other printed materials.

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