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PRESERVATION OF DIGITAL INFORMATION RESOURCES: ISSUES AND SOLUTIONS

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ABSTRACT

This study outlines the different kinds of information resources available, the current situation of digital preservation, the requests of librarians and users, and offers recommendations, although limited, for future research on storage mediums, transfers, conversions, and general management techniques. Libraries worldwide have had to address a number of concerns related to digital information preservation, including organizational, resource, legal, and technical ones. Despite the fact that libraries have been exploring a variety of preservation techniques, including emulation, migration, and technology preservation, there is still a need for a preservation approach that is both financially realistic and widely accepted. Digital content access is ensured over time through a combination of rules, strategies, and actions known as digital preservation. An information resource is any component of a computer system that is only partially available; an electronic resource is information that can be stored as electrical signals; and a web resource is a data source that is accessible over the World Wide Web. It is important to preserve information of long-term value so that future generations can access it. This is the goal of information source preservation. Formal preservation programs have been launched for conventional resources in document, microform, photographic, and, to a lesser extent, audio-visual formats by numerous large libraries, information centers, and archives in recent decades. The field of digital preservation is still quite experimental and fraught with the dangers of using unproven techniques. The introduction of digital preservation adds to the challenge facing documents and library services in maintaining a legacy of documents in traditional formats.

KEYWORDS: ***Library Services, Information Resources, Digital Content, Digital Preservation Strategies.***

INTRODUCTION

Nature has given the human mind a tremendous gift, as shown by the fact that ideas and facts were stored there long before recording and other means of storing information were invented. Ancient knowledge was crucial to the ancient world because, at that time, there was only one medium available for storing and preserving information and knowledge the "human mind" instead of written or other storage media. Thus, there is no question that, with the development of written communication and preservation, significant knowledge and everything he knew were preserved in human memory.

The main sources of ancient understanding in the modern age include manuscripts made of papyrus, parchment, palm leaves, vellum, and paper, or they can be found in stone, wood, leather, or other media that the scholars used to keep their information before writing instruments were invented. As the ancient, priceless treasures represent our cultural and traditional values and tell the tale of the evolution of past civilizations, it is our duty to protect and conserve them for future generations. The development of handcrafted writing instruments In the past, paper was a crucial medium for storing information; handmade paper predominated in all spheres of society.

Manuscripts written on handmade paper that are kept in museums, libraries, monasteries, and other locations contain the majority of historical knowledge. There is currently a major issue with the maintenance and care of these priceless treasures. The preservation and distribution of knowledge and information have always been significant functions of libraries and museums. It is a repository of information where organized knowledge is kept. The library serves its patrons' specific as well as general needs. Ethnic libraries are particularly significant among special libraries because they protect a country's or civilizations cultural legacy.

India has historically been a fantastic place to study. During the 7th and 5th centuries B.C., Takashila/Texila (present-day Pakistan) and Nalanda (Bihar) were two significant centers of learning. The traditional collection in conventional languages was quite good in these educational institutions. A great deal of madrasas with extensive collections in Persian, Arabic, and Urdu were founded during the ancient era, particularly all over the period of the Mughal Empire. Many universities, colleges, and new learning institutions that were established in the contemporary era provide materials incorporating contemporary Indian languages as well as an assortment of eastern literature. Furthermore, India possesses an abundance of oriental treasures, including manuscripts, rare books, currency, edicts, "Shahi, farmers," and other things. This priceless find is available in a number of Indian and classical languages, including Arabic, Persian, Hindi, Tamil, Urdu, Pali, Sanskrit, and Pali. These resources provide an accessible representation of Indian cultural history in the fields of literature, languages, and theology. Architecture, archaeology, mysticism, philosophy, religion, epigraphy, etc.

The shift from print to digital material has created difficulties for libraries in terms of preservation, access, and storage. Computers, tape players, and television sets are a few examples of bulky library supplies. Compared to books, many media resources in libraries are more susceptible to misuse and negligent handling. The organization and maintenance of library resources by librarians have improved with the introduction of computer-based technology. ICT advancements have made it easier to acquire, organize, and preserve library and information materials. Despite this, consumers still struggle to use the internet to access the resources that are available.

Digital preservation is the term for a set of guidelines, tactics, and procedures used to guarantee access to digital assets throughout time. At present, there is no feasible, enduring strategy to ensure the readability of digital material in the future. Digital documents can be lost or become obsolete owing to a diversity of factors, including material deterioration and obsolescence, software updates, or hardware failure. They can also become unreadable and inaccessible. To make sure that an equally current and upcoming generation can access information of lasting significance, it must be protected. The preservation of information sources aims to achieve this. The term of digital preservation, the contents of information resources and their types, the present scenario of digital preservation, the requirements of users and custodians, and recommendations for storage media research needs, migration, conversion, and general management techniques for the digitization of knowledge resources are all discussed.

DEFINITIONS

The practice of preserving records in digital format to maintain the information's usability, durability, and intellectual integrity is known as digital preservation.

According to the American Library Association (ALA) (2007), *"digital preservation involves policies, plans, and procedures that ensure the availability of digital materials over time."*

According to Kelly's (1999) definition, *digital items are things that are kept, preserved, and made accessible for a long time. This can include any kind of digital information, such as databases, image files, multimedia CD-ROMs, and text documents. If one or more technological preservation approaches are used, this is frequently what occurs. The term "digital preservation" has multiple definitions.*

NEED OF THE STUDY

In order to meet the varied demands of library users, the study highlights how crucial professional growth is for librarians. Additionally, it demands that government agencies equip libraries with infrastructure, including facilities for skill-building and training on digitizing materials. Sufficient financing is essential to the running of libraries since it allows for efficient training and material digitization. Environmental factors are also very important for the

safeguarding of library materials. Cultural heritage materials should be kept in air-conditioned, reasonably heated rooms with electric fans to ensure preservation. Libraries may guarantee efficient service delivery and preserve their cultural legacy by giving priority to these elements. Nowadays, there is a renewed global focus on efforts to conserve cultural heritage treasures. Cultural heritage protection is not just a historical but also an economic process. Cultural legacy preservation is not as deeply ingrained in Ugandan culture as football is, but many people and organizations believe that cultural resources are essential to the country's tourism-based economic growth. The foundation of our cultural legacy is the parts of our history that we value, wish to preserve, and transmit to the outside world and future generations.

OBJECTIVES OF THE STUDY

The primary objective of archival facilities, libraries, and museums is to make their collections readily available to those who are supposed to use them. These institutions have diverse collections in a variety of media that convey a great body of information amassed over the organizations' histories. The study was motivated by the question, "What are the duties of libraries in the safeguarding of cultural heritage?" which therefore becomes pertinent in this context.

A REVIEW OF RELATED LITERATURE

Academic libraries are primarily designed to assist and further the goals of their parent institutions, which include learning, research, teaching, and leisure. The caliber and quantity of an academic library's staff and collections have a very important impact on the services it offers. Libraries must be provided with sufficient print and non-print library materials for user access in order to provide effective service delivery.

Osunride & Adetunla (2017) described a library as a knowledge reservoir and a social institution tasked with educating the public without regard to race. Since information collections contain facts, ideas, thoughts, accomplishments, and proof of human growth in a wide collection of contexts, ages, and orientations, they represent the invaluable legacy of humanity.

Bolt (2014) Public libraries, like archival centers, maintain social interaction because people visit them to utilize their cultural resources. However, if public libraries serve as repositories of cultural items, they will also draw people from the surrounding communities, which mean that everyone, even the elderly, will be proficient in employing the library's cultural resources.

Lawal and Opeola (2012) defined an academic library as an institution that serves the needs of those pursuing higher education. Organizations such as polytechnics, colleges and universities of education, and colleges of technology.

According to **Sivakumaren, Geetha, and Jeyaprakash's (2011)** research on ICT resources at Indian university libraries, PCs, printers, scanners, and photocopiers were, as an outcome of technological advancements, the best part of facilities utilized, and ICT applications have expanded library functions and raised user expectations.

Dim and Osade Be (2009) have discussed In a nutshell, public libraries exist to preserve and make cultural information sources available to the community they provide at all times. Public libraries have a duty to preserve the cultural history of each community they provide for future generations since they hold information about the community's assets and vulnerabilities. If a culture loses both its cultural history and its identity, it is deemed endangered.

WHAT IS THE PRESERVATION OF DIGITAL DOCUMENTS?

According to definitions, digital preservation is the process of preserving data in digital form to guarantee the information's usability, durability, and intellectual integrity. Any library or information center faces a difficult problem because its future depends on its ability to preserve "born digital" and "digitized materials" for both current and future users. The storage of rare documents, the use of optical character recognition (OCR) to modify languages, migration, cost, and other concerns are all made more difficult by modern technologies that make it easier to create, store, preserve, and provide access to facilities for users who are located far away. Access to

cultural resources such as manuscripts, paintings, historical documents, photos, and rare books is restricted, and daily use of these materials presents significant risks such as book damage and security issues. Approximately five million manuscripts, possibly the world's largest collection, are dispersed throughout India as individual and institutional holdings. Digitization is the only method that will enable access to the materials for both current and future users.

THE NATURE OF DIGITAL PRESERVATION

It is obvious that retaining data is only one aspect of digital preservation. Preservation is definitely not one of the many benefits that digital resources have over their analog counterparts. It is widely acknowledged that there is a far higher risk of data loss when storing data digitally than when storing it in any other physical format. Digital information cannot be preserved for long periods of time due to limited media life spans, out-of-date gear and software, antiquated media with slow read times, and abandoned websites (Chen, 2001). The perspective on digital preservation that has been discussed thus far includes the following:

- Preservation of facts as a stream of bits;
- Preservation of metadata, or information about the data;
- Ensuring that the data can be located;
- Ensuring that there are practical methods for accessing and retrieving the data; and
- Offering tools to replicate or simulate the expertise of using the data.

We seem to be going much beyond what is anticipated for the preservation of books or paper records when we demand that preservation managers describe the experience that has to be re-presented. However, when it comes to non-digital resources, the finest preservation programs have most likely adopted a similarly comprehensive strategy.

PLANNING FOR DIGITAL PRESERVATION

A reliable form of record preservation with a 500+ year lifespan is microfilming. Documents can be microfilmed first and subsequently digitized from the film master, according to a hybrid solution. High-resolution scanning is made possible by this method, which is challenging given the scanning and display technologies available today. Digital technology's ongoing migration problems can be avoided by securely archiving and retrieving high-resolution microfilm masters for use in future digital versions. The microfilm master can be used to build new digital files as needed. Successful digital preservation requires a long-term commitment and is a multifaceted development that takes existence to establish. It is advisable to consider the following factors before moving further with digital preservation:

Does the library possess the resources required to maintain the information?

- Manpower requirements, institutional dedication, and staff involvement in the library
- Technical personnel for programming, server maintenance, standardization creation, metadata creation, and project implementation
- Parent organization budget provision
- Suggested platform
- Commercial or open-source software selection
- Additional things, such as appropriate guidelines and copyright issues
- File format selection.
- To put it simply, digital files that take up a smaller quantity than others should be restricted and stored on the server.

DIGITAL PRESERVATION STANDARDS

The continued preservation of digital materials, as robust as their accessibility, discovery, and sharing, depends on digital safeguarding standards. They are essential for societal dedication and collection care and might be generic or industry-specific. Nevertheless, the lack of accepted guidelines, procedures, and tested techniques, as well as the propensity to address preservation concerns subsequent to a project or loss, place constraints on digital preservation. They can't be used as a digital preservation method because of things like standards' adaptability, competitive pressures, and fast development. Standards must be a component of a set of preservation strategies that

combine industry best practices and general standards to meet the specific requirements of the organization and its environment in order to ensure long-term preservation.

ISSUES WITH DIGITAL PRESERVATION

- **Copyright:** Digital transformation is the method of translating a piece of work into a machine-readable binary language. Digitization is the process of saving information on an electronic device, whether a CD-ROM's floppy disc or a computer's hard drive. Such storing is classified as reproduction under the copyright legislation.
- **Accessibility:** The information is available at a faster pace. Globally connected networks that are very accessible.
- **Digitalization Costly:** the digital preservation of the library comes at a hefty price.
- **Bandwidth:** A digital library needs a set of bandwidth to transfer multimedia content, but that bandwidth is getting smaller every day.
- **Efficiency:** Obtain or retrieve information with ease thanks to digitization.
- **Environment:** Individuals may read printed literature, but digital libraries do not offer a typical setting for this.
- **Preservation:** A digital library's content may quickly become outdated and unavailable as a consequence of technological advancements.

DIGITAL PRESERVATION TECHNIQUES AND SOLUTIONS

Although numerous solutions for digital preservation have been put forth, no single strategy is suitable for every kind of data, every circumstance, or every organization. A few of them consist of:

- **Bit stream copying:** A stream of bits is the lowest form of digital content. Bit stream copying, also referred to as "backing up your data," is the process of creating an identical counterpart of a digital entity. Digital data is now stored in bytes. Modern storage technology functions in terms of bytes, and neither the end user nor the system level make the reader aware that eight distinct bits are packed into each byte. To preserve digital publications, libraries permit copies. The uses of items protected by copyright are limited under copyright law.
- **Refreshing:** Refreshing is the process of duplicating data while maintaining the original document's format. Though refreshing won't solve the issue of unstable media, it does provide a temporary fix for holding onto digital content by making sure that information is saved on more recent media before the older media deteriorates to the point where it can no longer be retrieved. Copy protection techniques are used to impede the copying process or restrict access to content protected by copyright. For these to work as intended, the protection mechanisms must be included equally in the storage mediums (CDs, DVDs, etc.) and the gadgets that access media (players, computing drives, etc.).
- **Persistent media:** Careful handling, regulated climate control, and appropriate storage can all help minimize destruction from media deterioration and lessen the need for refreshing. Because durable media might give users an artificial feeling of security, it may put content at risk. Adding copyright information to digital works is identified as copyright protection. These devices cannot prevent illicit copying; they can only identify it. To find the rightful owner, it is essential to obtain this information.
- **Technology Preservation:** Preserving the technological environment in which the systems are implemented is the foundation of technology preservation. Maintaining outdated technology in a functional state necessitates a significant expenditure on both workers and equipment. Preserving the environment in which resources were created and used—that is, the hardware and software environment in which the resource was accessed at the time of establishment—is the most obvious method of guaranteeing that the asset is maintained in its original form. This might be the most excellent course of action for some digital artifacts, at least temporarily, as it guarantees material accessibility by keeping both the object and its access tools intact.

The Significance of Digital Conservation

Since the mid-1980s, libraries have been migrating and updating their OPAC records and databases, which has led to an increasing concern about digital preservation. Digital preservation is approached using the principles of traditional preservation, and several approaches are shown. Storage management is covered, and metadata for digital preservation is crucial for long-term accessibility. Taking institutions, circumstances, and data types into account, microfilming and the digital transformation are regarded as hybrid options for dependable preservation. The paper highlights how crucial digital preservation is to libraries. The consequences of digital conservation stem from several basics related to the characteristics of library materials. The proliferation of digital materials in

libraries heralds a new chapter in their history. Libraries must now be more concerned with the preservation of "bits" than they were in ancient times, when they were mainly focused on the administration and preservation of "atoms." Although the preservation of physical books and journal issues presents its own challenges, national and university libraries hold copies of texts that date back hundreds of years and have, for the most part, been kept in immaculate shape. But how to manage library materials is an immense dilemma facing libraries today.

Safeguarding digital documents:

Delight library resources with caution:

- Make sure to always handle library materials with dry, clean hands.
- Don't pull the head cap.
- Preserve the materials in the library for upcoming users.

CONCLUSION

In today's librarianship, library preservation is crucial since libraries prioritize information sharing over material preservation. The capacity to preserve digital information is critical to the future of study and teaching. The majority of them deal with several issues nowadays for a diversity of reasons, and in ancient times, ignorance also resulted in the loss of many manuscripts. It is our responsibility to protect and preserve manuscripts because they cannot survive without adequate care, saving them for future generations. It is necessary to address non-technical challenges such as legal structures and digital preservation standards. Because ancient manuscripts and printed works may be lost forever, the safeguarding of library materials is essential to preventing the degradation of historical documents and public memory.

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