

# Digital Preservation: A New Viewpoint

**Dr. Shekhar K. Dongre**

Librarian

Mulund College of Commerce

**Abstract:** *Preservation is an important function of any library, archive, and information organization to utilize the preserved articles for the present and future generations. The purpose of preservation is to ensure protection of information of price less value for access by present and future generations. Digital technologies present a preservation solution for the documents in the libraries with increased access to digitized documents over the electronic networks. Now- A- days many libraries have established format preservation programs for traditional materials and take preventive measures to arrest deterioration of materials. The paper presents the issues and challenges of digital preservation and suggests strategies for solving the preservation problems.*

**Keyword:** *Digital Preservation, Digital Longevity, Digital preservation process*

## 1. Introduction

Digital technology and high speed networking have become two important components for the development of the society. In the recent past, significant progress has been made to define the terms and outline a research agenda for preserving digital information that was either originally digital or transformed to digital from traditional sources. The aim of digital preservation is to maintain the ability to display, retrieve and use digital collections in the face of rapidly changing technological and organizational infrastructures and elements. It refers to the various methods of keeping digital materials alive into the future. It is needed to preserve the digital materials on a scale commensurate with mass storage capabilities and in formats that are accessible and usable.

## 2. Concept and Digital Preservation

Digital preservation is a process by which digital data is preserved in digital form in order to ensure the usability, durability and integrity of the information contained there in. Digital preservation comprises the planning, resource allocation and application of preservation methods and technologies necessary to ensure that the digital information of continuing value remain accessible and usable. The main purpose is to ensure protection of information of enduring value of access by present and future generations.

## 3. Need for Digital content preservations

The preservation and archiving of digital information is one of the greatest challenges for the library professionals there days. The main problems with digital preservation is that digital technology is an extremely fragile medium for the cultural memory of the world.

## 4. Issues

The issues to be addressed in digital preservation include

- a) Retaining the physical reliability of the image files, accompanying metadata, scripts and programs (e.g. make sure that the storage medium is reliable with back-ups, maintain the necessary hardware and software infrastructure)
- b) Ensuring continued usability of the digital image collection (e.g. maintain an up-to-date user interface enable users to retrieve and manipulate information to meet their information needs.)
- c) Maintaining collection security (e.g. implement strategies to control unauthorized attention to the collection, develop and maintain a rights management program for free-based services)
- d) Also there are other technical, social and legal issues as mentioned below.
  - i. The rapidly increasing number of digital objects and proliferation of document standards and formats.
  - ii. The increasing complexity of digital objects and their increasing software dependence.
  - iii. The lack of planning to incorporate preservation needs in systems and lack of availability of the shelf products supporting preservation needs.
  - iv. The lack of technical expertise in preservation standards and techniques.
  - v. An emphasis on the creation and/or acquisition of digital material in an era of diminishing resources, rather than on going preservation and access.

## 5. Affecting factors

There are many factors which affect the process of digital preservation. Some such major factors include the following:

- a) Type of material (b) Type of file format (c) Type of media (d) Type of platform/ operating system.

## 6. Digital Longevity

Information stored in digital format does not last forever due to the fragility of digital works. The life of data written to optical media such as CD-ROM or DVD may be measured in years. We have not yet achieved much stability in data storage technology. There are administrative procedural organizational and policy issues surrounding the management of digital material. Digital materials are to be (a) Generated (b) captured (c) Transmitted (d) stored (e) maintained (f) accessed and (g) managed. Many efforts have been taken for survival of digital data for longer duration. This concept is known as retention intension.

## 7. Strategies

There are various strategies, which can be adopted while processing digital preservations. Some important strategies are given below.

- i. Intellectual preservation involves printing digital material on paper and recording on microfilm
- ii. Technology preservations aims at preserving the software and hardware environment that has been used to access the resources when that was created. It many prove to be the best solution for some digital objects in the short term but not in the long term.
- iii. Emulation refers to creating new software that mimics the operations of older software.
- iv. Data migration involves change in the configuration of the underlying data, without change in the intellectual content. Thus, the purpose of migration is to preserve the integrity of digital objects and to retain the ability for clients to retrieved, display and otherwise use them in the face of constantly changing technology.
- v. Refreshing involves periodically moving one from one physical storage medium to another storage medium in order to avoid physical decay or obsolescence.
- vi. Data archaeology involves recovery of data by using better techniques available in the future.
- vii. Output to analog media provides a presentation copy in an analog format. As a matter of fact microfilm cannot capture all of the features of original object that satisfied the access need of the majority of the uses.
- viii. Software/ Hardware migration: because of the issues of obsolescence all products of digital preservation must be migrated at some point, at the very least to a file format that the latest technology can recognized. If someone wants to preserve the whole system, then operating systems and functional software must be migrated as well. In order to protect one's digital assets, one wants to formulate a migration policy that is implemented on a regular basis rather rather than a reactionary action to new software or hardware. After migration it is crucial to test the documents to ensure that functionality has been preserved.
- ix. Metadata: It is the information about the creation and maintenance of the digital images. Metadata is crucial to preserve. It is important to ensure that metadata is recorded somewhere in outside of digital asset management system.

## 8. Basic requirement

Digital documents possess a unique collection of core digital attributes that must be retained.

The use of computers keeps changing the way information is created, managed and accessed. The ability to create, amend and copy information in digital from, to search texts and databases and to transit information over networks has led to a drastic growth in the application of digital technologies.

Digital resources will not survive or remain accessible and hence proactive preservation is needed. Digital preservation is needed to increase the nation's investments in digital resources to secure the intellectual and cultural records that exist only in digital form.

- The use's expectations change frequently. They require each one of the following traditional documents and electronic documents or old information's as well as new ones.
- The libraries and archives should plan for digital materials taking into consideration their resources.
- Preservation should be made in all the formats keeping in view to satisfy the user's satisfaction.
- Storage media should have different formats such as text, data, graphics, video and sounds, different storage capacity like floppy disk, CD-ROM, VCD etc.
- The uses of digital material from the view point of libraries, archives.
- Responsibility for preservation is closely associated with the ownership. In the case of digital material the ownership is diffused. Libraries or information centers often pay license fee for accessing the digital material, which is hosted at the server of the publisher. The libraries will have to get permission from the right owner which may be the author himself or the publisher or nay other intermediary. The digital information objects with long term cultural and intellectual value should be preserved with their integrity. The integrity of the information objects in the digital environment is fragile. One of the greatest threats to the long life of the digital information is the ease with which it can be abandoned and then destroyed. One of the mechanisms against this danger might rest in enacting laws covering preservation of digital material. A depository system might serve the purpose. Under this system, publishers could be legally bound to place with the National library a copy of their published digital works in a standard archival format. Intern it would put responsibility on the National Library to protect the integrity of the digital materials over the long term and retain them in an accessible form for future use.
- The Librarians and archivists must join together to develop active steps and policies for preserving digital information. Coordinated efforts are a must for developing solutions to digital preservation. The acceptance of shared responsibility and shared funding commitments will ensure that no valuable digital information is lost for future generations.

## 9. Rules of preservation

There are some basic rules laid down for preservation as follows:

- Retain an analog version of digitally reformatted items until the life-cycle management of digital data passes all the tests of smooth access for as long as or longer than the analog version. The analog version may be the original item, paper facsimile, video cassettes or microfilm copy and may be restricted for use after the digital reproduction is available.
- Ensure the appropriate handling and treatment of originals, disbanding, housing and other related matters.
- Minimize handling of originals in digital reformatting work to assure the best digital capture of an undamaged original, as well as the longevity of the original item, especially it is to serve as the analog version.
- Ensure that the digital master file will allow a broad range of future use, including planned phases of delivery by employing appropriate students and best practices for wide access.
- Capture the highest quality digital image technically possible and economically feasible for large scale production, while optimizing the potential for longevity.
- Archived digital master file that in free of or minimize, artifacts introduced by the reformatting process, whenever possible.
- Ensure the completeness of all materials being digitally reformatted to the same standard.
- Optimize digital images of paper based text materials use is creating a new facsimile, when appropriate.
- Employ economical, automated methods to create machine readable test with minimal encoding to provide access with searchable test.

- Employ standards and best practices for structural, administrative and describe metadata that will optimize inter opposability with national and international digital library.
- Check document digital master with checking tools and use them to ensure the data integrity of master files through backup and migration.

## 10. Digital preservation process

There are essentially five main storage application that occur during the digitization process. Production, Data transportation, preservation to the public, Backup or Archiving and Migration.

- **Production:** The production or creation of digital material generally requires sufficient hard disk capacity to store working files while they are being manipulated and developed. If the collection is considerable and there is large production environment, a Redundant Array of inexpensive Disks (RAID) may be the most appropriate however storage for active files can generally be handled by a large hard drive. It is important to outline the various processes one need to perform on the same images and then determine how may “active” files one need at any one time.
- **Data Transportation:** Generally, moving digital information is handled by portable storage devices such as recordable CDs (Compact disks) and more recently by DVDs (Digital Video disks or Digital Versatile Disks) The capacity of the CD and DVD is greater than that of the tape drive, an early favorites for data transportation, though its transfer rate is slower than tape. Another feature of the CD is its compatibility across platforms. The CD-R (a CD which can only be written upon once) is a secure format, “Write once mechanism” does not allow overwriting. CD-RW (CD Real/Write) is less secure but more versatile.
- **Presentation to public:** most institutions making images of their collections available to the public via the internet make use of in-house servers or rent space on commercial servers.
- **Back up/ archiving:** Digital collection should be backed up in a format that is easily accessible and stored remote from the original source on a routine basis. When evaluating storage for back up, the inevitable dilemma is between speed and cost. Most managers prefer tape for backup, as it may be used, at non-peak hours, when speed is not an issue. For small networked systems, tape backup is the common practice.
- **Migration:** In the context of digital preservation, migration refers to the shifting of digital objects from old media formats and software programs to new ones. Migrations of backed- up digital material needs to be as easy and cost-effects as possible for institutions to buy into a system. Decisions must be made in every institution concerning what information will be saved and migrated and what will not be based on a combination of cost effectiveness, intellectual necessity and moral and professional obligation.

## 11. Conclusion

Preservation keep materials alive, intact and available for use so that they can be authoritatively used as long as possible (I) to document our heritage and our society and (II) to guide the other who will come in the future.

Preservation of digital material is indeed a very challenging task for library and information science professional. The future of library and information services is closely associated to the preservation and new technologies will create, collect, store, process and retrieve the information and deliver across the globe.

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