Digital Preservation: Best Practices

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Introduction:-

Digital Preservation refers to the management of digital information over time. The preservation of Paper or microfilm, the preservation of digital information demands ongoing attention. This constant input of effort, time and money to handle rapid technological and organizational advance is considered the main stumbling block for preserving digital information beyond a couple of years.

1. What is Preservation?

Preservation is the process of keeping an object safe from harm, loss, damage, destruction or decay, and maintaining it in a reasonably sound condition for present and future use.

Preservation is an indirect method of treatment in which the environment around an item is changing. This includes stabilizing, maintaining and monitoring temperature, humidity, light exposure, air pollution, dirt, dust and mold. Preservation also includes surveying the condition of the building and the collection, the construction of protective enclosures using acid-neutral or buffered materials, proper storage and handling techniques, security, disaster prevention.

2. What is Digital Preservation?

Digital preservation is the active management of digital information over time to ensure its accessibility. Preservation of digital information is widely considered to require more constant and ongoing attention than preservation of other media. This constant input of effort, time and money to handle rapid technological and organizational advance is considered a major stumbling block for preservation of digital information. Indeed, while it is still possible to read the written heritage produced several thousand years ago, the digital information created merely a decade ago is in serious danger of being lost. That would create a digital Dark Age.

Digital preservation is the set of processes and activities that ensure; continued access to information and all kinds of records, scientific; and cultural heritage existing in digital formats. This includes the preservation of materials resulting from digital reformatting, but particularly information that is born-digital and has no analog counterpart. In the language of digital imaging and electronic resources, preservation is no longer just the product of a program but an ongoing process. In this regard the way digital information is stored is

important in ensuring its longevity. The long-term storage of digital information is assisted by the inclusion of preservation metadata. There are three types of digital preservation.

- Long-term preservation: Continued access to digital materials at least to information contained in them, indefinitely.

- Medium-term preservation: Continued access to digital materials beyond changes in technology for a defined period of time but not indefinitely.

- Short-term preservation: Access to digital materials either for a defined period of time while use is predicted but which does not extend beyond the foreseeable future and until it becomes inaccessible because of changes in technology.

According to Kelly Russell, "Digital preservation is a process by which digital data is preserved in digital form in order to ensure the usability, durability and intellectual integrity o the information contained therein."

"The long-term maintenance and upgrade of digital files on digital storage medium."

"Digital preservation combines policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change. The goal of digital preservation is the accurate rendering of authenticated content over time." (ALA 2007:2)

Digital Preservation - Basic Requirement

Preservation of digital material is a complex task. Digital contents are less like artifacts and more like signals-signals that must be continuously refreshed or otherwise they may disappear.

To preserve digital material with mass storage capabilities some fundamental requirements are necessary. These are:

- The uses of digital material from the point of view of view of libraries, archives.

- Maintenance, preservation and dissemination of information.

3. Need of Digital Preservation

3.1 Storage Media/Data Carrier Problem

Digital objects are much more 'fragile' than traditional analogue documents such as books or other hard copy mediums. Digital objects are fragile because they require various layer of technological mediation before they can be heard, seen or understood by people. Digital objects are also much more venerable to physical damage. One scratch on CD-ROM containing 100 e-books can make; the content inaccessible, whereas to damage 100 hard copy books by one scratching move is fortunately - impossible. A flash memory stick may drop into a glass of water or get magnetized. Portable hard drive or laptop can slip from one's hands and get irreparable damaged in a second.

Digital objects require pro-active intervention to remain accessible. While you can put a book on a shelf and return to it after 100 years and still when you open; it, ;;y;; ou see the content as it was intended by the author/publisher. The same approach if benign neglect to a digital object is almost a guarantee that it will be inaccessible in the future.

3.2 Hardware Obsolescence

Even if you return to the digital object after five years to find whether the disk is in working condition and you have a software that can open the file, but if that file is on a disc your computer doesn't have a drive for, you will not be able to access it.

3.3 Software and Format Obsolescence Problem

Alternatively, the software or file format can become; obsolete for a number of reasons. For example, ;;;;software upgrades may not support the old legacy files; the format take up is low and the industry does not produce compatible software which supports the format may be bought by a competitor and withdrawn from the market place. Without the intervention of digital preservation techniques the information contained will no longer be accessible.

In short, need for Digital Preservation is due to the following reasons.

- Records become old.

- Diversity and complexity of recorded materials increases and there is limited budget.

- Escalation of prices.

- Increasing concern for preserving artifact values of information materials with innovative technological know-how.

- Emergence of digital products.

- Integral part of librarianship life span of information materials sources are artificial Nature of individual entities of the collection.

- Protected and Preserved for current and future generation.

4. Objectives of Digital Preservation

- To preserve all recorded materials of significant value.

- To preserve the maximum amount of information carried by the original

- To provide for the longest period of preservation, practicable with the present technology and compatible with the other requirement.

- To provide for the continuous and ready availability of the preserved materials to anyone who needs them.

- To avoid unnecessary duplication of effort and expenses.

5. Types of Digital Documents

Digital preservation concerns two types of documents.

- Born-Digital documents.

- Digitized documents.

- Born digital documents: These refer to those materials that were initially created using some form of digital technology. These 'electronic records' could be grouped into two generations such as:

- First generation of electronic records. (flat file or comma delimited ASCII files)

- Second generation of electronic records. (object oriented databases and multimedia files)

- Digitized Documents: these refer to those materials, which have been transformed from analog to digital through some reproductive means such as re-keying the information or scanning the document or object etc.

6)   Digital Preservation Techniques:

There is no one single solution to the challenges of digital preservation. Digital preservation continues to present a complex challenge which is way there are so many different strategies and a member of different applications currently being undertaken by various organizations around the world to address the digital preservation challenge.

There are some digital preservation strategies available currently for addressing digital preservation. The choice of strategy depends on the nature of digital material to be preserved, the purpose of retention and the organization. Some of the strategies available are given below.

- **Migration**

Migration is the transfer of digital materials from one hardware or software type to another or from one generation of computer to another. Migration can also be the transfer to non-digital media such as paper or microform, or the transfer to a more suitable medium for example floppy disc to CD-ROM.

Emulation

Emulation is duplication the functions of one system using a different system so that the second system he haves and appears to be the first system and the original digital material is thought to be still available in its original form. Emulation is a way to combat technological obsolescence a s it provides a way of preserving the functionality of access to digital information which may be lost with the software or hardware when it becomes outdated.

Encapsulation: Encapsulation is the grouping together of digital objects and metadata needed to provide access to the object. It is seen as a solution to technological obsolescence for file formats because all the information to interpret the 'bits' is available.

Normalization: Normalization involves the migration of digital records to standard formats. Normalization is the most frequently used preservation strategy. What occurs is the data file format is detected and converted to an open format for preservation. Using this technique the records authenticity may be lost if essential metadata is affected during the conversion.

Bit Stream Preservation: Bit Stream Preservation is storing the binary code of the digital object. It is not a stand along process. Bit stream preservation is to be used as a foundation for other preservation strategies. The object will not be viewable without the original creation hardware and software, thus it needs to be used in conjunction with other preservation strategies to ensure accessibility.

Technology Preservation: This involves preservation of working replicas of key computer hardware with the programs that run it and on it. This is not a viable preservation option is the long run due to the costs associated with maintaining the ageing computers and the staff and training required to maintain and run the technology.

Open Archival Information System (OAIS): Open Archival Information System (OAIS) is the only official standard in digital preservation. A reference model is available that provides a model and framework for building and maintaining repositories for long term preservation and access to Digital materials.

Digital Preservation Policy: The choice of technology is not the only consideration of digital preservation. Successful digital preservation also requires the creation of a preservation policy or guidelines, so that staff and stakeholders are clear on what, how, when, where and why records are digitally preserved.

Conclusion: Preservation is an important activity of a library. Today preservation of digital documents has become an imperative because of obsolescence of hardware, software and standard file formats. Libraries and archivists need to study thoroughly various issues and concerns about digital preservation because more number of collection is now available in digital format.

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