

REQUISITE OF DIGITAL PRESERVATION FOR SHIFTING OF PRINT MEDIA TO DIGITALISED ONE AND THE ROLE OF LIBRARY PROFESSIONAL TO ENHANCE THE GROWTH

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ABSTRACT

Digital preservation refers to a sequence of managed activities essential to confirm continuous access of digital information easily with the help of information technology as long as they are required. This paper makes an attempt to discuss the essence of digital preservation and the advantages of digital preservation over the same for the paper based media and the techniques used to preserve digital materials in the national library of India. Familiarity with IT infrastructure, including hardware, software and web development, acquaintance about the methodology of digitization processes and key metadata standards, expertise and proficiency of technical staff and adequate funding are the essential qualities of digital preservation. This paper also includes different measures to solve the problems for digital preservation.

Keywords: Digital preservation, digital records, preservation activities, digital preservation responsibilities, Print media

1. INTRODUCTION:

We are now living in the information age with the advancement of information technology. Preserving, protecting and documenting of manuscripts, old, rare and valuable collections of the libraries, information centres and archives by digitization for conserving our textual heritages is an important field in recent times. Electronic systems offer many advantages, thus different institutions and agencies must ensure that the electronic records they captured should survive as long as these are needed, and can be read and understood in future. For example, even important email messages must be stored into corporate recordkeeping systems where they can be preserved steadily and found easily. Preservation of digital records is also significant as the records should be accessible and be migrated forward with the changes of hardware and software.

2. SCOPE OF THE PAPER:

This paper is primarily aimed at with an interest in approaches to preserving digital records and the requirements of digital preservation. It discusses the essential characteristics of the digital preservation and includes the advantages and disadvantages of paper based and digital preservation and states the extra precautions required for the preservation of digital records. This paper also discusses the essential skills and concepts of the library professional required for digital preservation.

3. DIFFERENCE BETWEEN DIGITAL RECORDS AND PAPER BASED MEDIA:

For many years print media is being challenged by its electronic counterpart. But there are several unique advantages that help both the mediums to create a suitable position in the media industry.

3.1 Use of Technology:

Print media reproduces text and image with ink on paper using printing process. It is often carried out as a large scale industrial process, and is an essential part of publishing and transaction printing. Print media are created electronically, but do not require electronic energy to be accessed by the end user in the printed form.

Electronic media utilizes electronic energy or electromechanical energy for the end user or audience to access the content. The primary electronic media sources familiar to the general public are video recordings, audio recordings, multimedia presentations, slide presentations, CD-ROM and Online Content and also digital media. However, electronic media may be in either analogue or digital format.

3.2 Geographical Area

Print media is more capable than electronic media to deliver localized news that may interest city or district residents. Print media, particularly newspapers, tend to focus on a specific geographical area. But magazines and renowned books and familiar journals etc. print media can have a wider circulation, still they can only circulate so far. This means that the circulation of print media is fairly limited. In contrast, online media can be accessed worldwide over the Internet, having larger no of audience.

3.3 Storage capacity:

The storage capacity of electronic media is better than printed media. Electronic media like computer, Floppy disks, CDs and DVDs and above all digital cards give us lots of information than printed media. Internet provides us with unlimited space to write about whatever we want.

3.4 Images:

The print media and the online media both can use amalgamation of text and still images. The online media can also incorporate moving images and videos. The authors or the originators have the opportunity to continually update and change their images, as the content is online and not printed.

3.5 Updated information:

The digital article had the ability to follow up or correct any mistakes on the original article any time after its publication. But there would be no chance on going back to the original article to correct it, if a mistake were made in the original print article. In order to correct a mistake, the author would have to wait for the next edition.

3.6 Permanence:

Print media and electronic media, both types of media, can be saved for future reference. Print media allows reader to store articles that be used any time in the future. Books, manuscripts, and other valuable documents can be preserved for a long time. People can cut clippings from newspapers and magazines or save a web page to view at a later time. But the standard of television news is deteriorating much faster than that of print media. Other media such as radio is perishable, as the audiences have no opportunity to save the audio; instead they have to remember it or wait for it to be played again. Technology cycles are short and due to the dynamic nature of the IT, technological obsolescence occurred rapidly in case of storage media like disks, tapes and cartridges etc.

3.7 Immediacy vs. Validity:

Online media can present the audience with information as soon as it is available. Now people can access the internet on their mobile phones, which grants them access to online media anytime and anywhere. But print media has to go through the printing process before it is available to its audience. There are various levels of editorial checking and rewriting in publishing. It allows editors to check the validity of the information and produce a more developed text.

3.8 Cost:

Most online media is free and usually less expensive than viewing print media. The cost of the publisher to produce a document is very high. But the initial installation cost of the digital media is more than that of the printed media. One of the greatest constraints to Internet access in poor developing countries is the cost of purchasing the hardware. According to the report of the UNDP (1999) in Bangladesh, a computer costs more than eight years of income of an average earner, compared to one month's wage of an average American.

3.9 Sponsored links:

Digital information provided in the computer and internets are equipped with further links which helps the searcher to get their required information easily. It encourages the exhaustive search of a particular subject. Reference lists are also provided in the printed article for further readings. But the availability of these documents is not easy and sometimes impossible whereas a searcher can get his required information from the internet by only one click.

3.10 Environmental impact:

Both the online and print mediums pollute the environment. A Swedish environmental study found that print publishers pollute more from the act of making and distributing their product, and online publishers pollute more from requiring readers to use energy. The digital devices emit heavy amounts of carbon and radiation into the atmosphere which is highly harmful for all the living beings. Moreover the obsolete print products can be used as manure to the plants. But, the degree of pollution depends on the specific industrial practices in a given area.

3.11 Enjoyment:

There are readers who love to feel of print media, and there are readers who love the speed and accessibility of online media. There are those, who love digital media so much that they ditch their print newspaper editions in favour of the digital versions. Feeling is more effectively guided the readers' intuitive sense than that of the content. Some readers favour print media over online media because they are not comfortable with the online media and they also consider that the digital media abolishes the human feelings and develops a man- machine interaction growth. [2] Digital preservation approaches comprises the following essential attributes:

- **Performance of the record:**

Both preservation methods involve decisions about how and which digital records are to be preserved. Digital records are varied and complex and all the records have not the same essential characteristics features that need to be preserved over time. Determining the essence of a particular category or type of record such as a word-processed document or email, digital records, floppy-disks, CD or DVDs, films, tapes and cartridges etc. before the application of any preservation treatment, is vital to ensure optimal, justifiable and accountable preservation.

- **Type of technology used:**

Most of the digital preservation program is based on the technology which is not protected by trademark or patent or copyright as registered data formats are unsuitable for long-term preservation and it is also not easily accessible. Thus the organization which has loyal to long-term access to digital records uses non-proprietary i.e. non-registered technologies for preserving their records (Moore, 2008).

- **Cost of preservation:**

Digital preservation approaches place a large and perhaps unsustainable burden on the archives, or national libraries and information centers. But most of the preservation effort needs to be invested at the beginning, not in continual maintenance or data conversion. Applying a preservation treatment to any type of archival record is both expensive and potentially harmful to the integrity of the record.

- **Number of preservation treatments:**

Formal mechanisms must be created for monitoring and preserving the appearance and texture that are considered essential to keep the originality of the performances. The risk of integrity of a digital record due to preservation treatment is extremely high in case of mass migration from one data format to another. The digital records can be altered little or may have no trace after preservation treatment. Frequent digital preservation treatments like regular or short-term migration may pose a great risk to the preservation of digital records (Dow, 2009). Thus the preservation treatment should be applied to the digital records where it is required and which lasts the extended period and which should consists of minimum number of preservation treatments.

- **Accessibility of the user:**

The digital preservation program will not bound or restrict the accessibility choices of the users of the records. However, such an attitude can greatly affect the flexibility of the access to use them. But the preservation treatments must be liable through the documentation available to

future users of the records and the preservation approach should impose minimal requirements on researchers to install and learn new software applications (Yadagiri and Nagaraju, 2012).

4. ESSENTIAL REQUIREMENTS FOR DIGITAL PRESERVATION:

According to Jones and Beagrie (2002), digital preservation refers to a sequence of managed activities necessary to ensure continuous access of digital materials as long as they are required. The digital information can be created easily with the help of enormous power of computer and network bandwidth. Huge amount of 'born-digital' data and specifically in science and engineering, petabytes of data are being generated with the help of IT and by various scientific instruments daily.

But the challenge for digital preservation is not just the volume of data. The hardware and software used to store and access digital information are continuously advanced and the previous one becomes out-dated. Thus the obsolescence of technology is generally regarded as the greatest technical threat to ensuring continued access to digital material (Dappert and Enders, 2010). The timeframe during which preservation action has been taken is very much smaller than for paper, often measured in just a few years due to the rapid advancement of technology. E.g. it is unrealistic to expect to view a Word 2.0 file on an Intel 386 machine with a Windows version 3.1 operating system, even though this technology is less than 15 years old. Preserving the source is still possible, but preserving the process is impractical because of the dynamic nature of the IT industry (Waller and Sharpe, 2006). The industry has been rapidly growing in a few decades, with enormous variations in hardware and software capabilities. Technology cycles are short, thus the creation lifespans also incline to be short. The consequences of this highly market-driven unpredictability are two-fold: rapid deterioration and technological obsolescence.

To ensure the comprehensive and feasible execution of the digital preservation the essential requirements of the libraries, archives and information centres are to build-up the infrastructures of the institution which includes three core components (Sivakumar and Tamilselvan, 2014).

4.1 Organizational-Infrastructure:

This includes the updating of the organizational mission statement and other supportive documents to accept digital material. It also demands to framework new policies or change of policies and practices aimed at long term investment for managing digital material, cost of technical support and training cost of the technical staff etc. (Jones and Beagrie, 2008). One survey research revealed that 55% of the respondents in one institution felt that their organization does not have the clear responsibilities for digital preservation and it was the major barrier to digital preservation. The problems noticed for another organization are the different roles and activities involved in digital preservation activities (Helen Hockx-Yu, 2006).

4.2 Technological infrastructure:

This includes familiarity with IT infrastructure and a better understanding of hardware, software and web development. It involves acquaintance about the methodology of digitization across multiple kinds of items, from text to images, floppy disks to audio and video DVDs and also the familiarity with a wide range of file formats and key metadata standards used in the community to describe physical and digital items. According to Alemneh (2002), protocol for Metadata Harvesting (OAI-PMH) or other similar harvesting method can be adopted to develop technological infrastructure. Standardization of transliterated metadata or metadata with

diacritical mark can be applied. Innovation in digital library development is also required to incorporate features of interactive Web 2.0 such as user interaction and content sharing, multimedia and mobile devices.

4.3 Resource Development:

Resource development covers organizational infrastructure development, technological development, manpower development and financial development. Insufficient resources and inadequate planning for digital preservation are considered major obstacles to digital preservation.

According to a survey of Hedstrom and Montgomery (1998) lack of staff expertise is a common problem for both in institutions having digital preservation responsibilities and in institutions that have not yet assumed responsibility for digital materials.

Human Resource Development is the key for achievement of digital preservation. Education and training of the archivists, preservation staff, librarians and information personnel is required. Before taking the responsibility for preservation programme the institutions should encourage to improve the requisite expertise and proficiency of its technical staff. Centralized computing services can partly support the digital preservation system having lack of expertise staff.

Adequate funding should be anticipated for proper nurturing, growth and long term nourishment of digital preservation initiatives. The costs and risks associated with digital preservation propagate when a digital collection consist of a large number of diverse file formats. Most of the cases initially funds are available for the first phase but not to sustain the projects in future. Thus the attitude of the organizer has to be changed. Public-Private-Partnership (PPP) model should be adopted to get adequate funding for digital preservation projects to become viable.

There is a need of a National Policy in India for digital preservation of data and for effective implementation of the policy. Government of India and a number of Indian libraries and various UNESCO'S programme have launched several preservation activities on valuable archive holdings, library collections and manuscripts to make these accessible to scholars and researchers ensuring their wide dissemination. National Library, Kolkata has initiated a mega project of digitization of rare manuscripts, books, artifacts, paintings etc. in digital form. The digitized documents are saved in CD-ROM / DVD. For digitization a very modern digital lab has been established which is doing the job with the assistance from the in-house staff. This project is under progress and this project is being funded by the Ministry of Culture, Govt. of India. The project set-up was designated into the following operational areas:

- **Image Capture Station:** The image capture station consisted of a digital camera, Nikon D100 with bayonet mount 28-70mm f/2.8 ED-IF AF-S Zoom-Nikkor lens, with side illumination through 40 watts incandescent lamp. The lighting was also provided selectively by two 1000-watt Elinchrome strobe lights at 45 % angle to copy surface.
- **Image Processing Station:** The image processing station has a HP Brio PC with Pentium IV processor, 128 MB DDRAM. The workstation had the image processing software like Kodak Imaging, Adobe Photoshop 6. There was an image transfer device connected to the USB port, which gathered images from the memory card of the digital camera. After

transferring the images from the Image Capture Station the deviation in terms of clarity, legibility and color were checked.

- **Final Editing:** The graphics level of each image was checked with the original. The images, which had come brighter, were toned down to match the actual. The unwanted stain marks, worm marks were removed. The color channels were checked to conform to 8 bit per channel specifications.
- **Format Conversion:** The base files were converted to three basic formats as per the requirements, namely PDF, TIFF and JPEG.
- **E-Book Format Conversion:** The individual image PDF files were tagged and a composite PDF file was prepared as per the original document pagination and sequence.
- **Required skills and concepts of library and information professional:**
- The skills and concepts those are vital for the library and information science professional and for the archivists to preserve digital records are:
- Acquaintance and knowledge about the IT infrastructure, which includes hardware, software and web development and wide applications of these digital devices.
- Expertise and knowledge about the methodology of digitization process of different kinds of items, from text to images, floppy disks to audio and video DVDs and with a wide range of file formats (Velmuruganand Kannan, 2011).
- Understanding about standards used in the Key metadata to describe the physical features of the digital items.
- An understanding of the acquisition and processing for collection developing and maintenance of the cultural heritage of the organizations.
- Knowledge of intellectual property law as the every presentation has rights associated with it.
- Preserving digital material for the future is an important responsibility.
- The librarian must be aware about preserving the images as the black and white images has no problem but the color images has no guarantee about life. Continuous examination is required for colored images.

5. CONCLUSION:

The lack of expertise in preserving digital documents appears to be a significant obstacle to develop digital preservation programs. The programs having highest levels of staff expertise incline to have substantial holdings of digital materials. Lack of standards, perfect planning and infrastructure and clear models are also the major problems for digital preservation of an institution. Technical concerns and challenges related to digital preservation consist of the lack of practical implementations of preservation standards and a lack of technical knowledge which is required to support the digital preservation process within an institution. The absence of standards, perfect models and best practices arises prominently in the areas where migration and frequent updating of hardware and software is required. Several digital collections executives stressed on the significance of working together as a community to initiate the progress of desired process, services, and international standards so that the vendors will also take part to meet digital preservation needs. Model policies, standards, best practices, training and expertise, specific storage medium, maintenance and conversion services are ideal for institutions introducing various preservation activities. Thus to solve the problems for digital preservation an institution should undergo the following practices:

- First to compile and distribute a set of guidelines, standards, and bestpractices for digital preservation.

- Offer leadership and coordination in developing standards and practices for digital preservation.
- Improve the resources to coordinate digital preservation activities between the member institutions.
- Improve the institutional policies for acquisition, conversion, storage and maintenance for digital materials.
- Cultivate trusted amenities and tools to support digital preservation in critical areas where needed.
- Providing accessibility of the researchers on a permanent basis.
- Active participation of the archivists, preservation staff, librarians, collection developers and supervisors in building the digital repository is most essential to develop a sense of possession for inaugurating the new culture of digital preservation.

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