Digital Preservation of Indian Manuscripts - An Over View

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Abstract

This paper presents a brief over view of Digital Preservation, Digitization of manuscripts and preservation techniques which are currently in use in India. The role of the National Library of India in Digital Preservation of Indian Manuscripts is highlighted. It also deals with the Manuscript Resource Centers and Manuscript Conservation Centers of India. The requirements of Digital Preservation are presented in this paper.

Keywords : Digital Preservation, Manuscripts, Digitization.

0. Introduction

India possesses one of the ancient and richest cultures of the world. India has the largest collection of manuscripts, containing ancient culture and knowledge representing thousands of years of history. The Indian manuscripts, which were written in different languages and scripts are preserved on treated Palm leaves, Birch barks, Silk cloth, Wood, Tamra Patras and hand made paper, inscriptions on stone etc. They are spread all over the country and abroad and are preserved in libraries, museums, temples, Mutts, monasteries etc. These manuscripts contain invaluable knowledge in medicine, science and mathematics, literature, art and architecture, theology, philosophy, music and dance etc. These sources not only provide information on these subjects, but also throw light on the history and culture of the nation.

In the past as a result of natural calamities like floods, wars, fire, and foreign invaders a good collection of old manuscripts were destroyed. Manuscripts and other old documents have been conserved with other artifacts like buildings, sculptures, paintings, monuments etc. Now the concept of preservation has changed. The manuscripts are preserved with the modern digital technology by converting to Analog or Digital copies of the original. At present the preservation techniques are coupled with the word Access, which is to provide information to those who need it in shortest possible time, with the new technologies like Internet, CD-ROM etc.

1. Digital Preservation

Digital preservation refers to a series of managed activities, which are necessary to ensure continued access of digital materials for as long as they are necessary. The term digitization refers to the conversion of material that was originally created in another form to digital form (i.e. which uses a binary numerical code to represent variables). The ultimate goal of preservation is to make the intellectual content to remain in tact as long as possible. The idea of protecting the original documents by reproducing it on a stable media gave rise to digitizing the maps, manuscripts, moving images, music and sounds etc. Digitization of the old and fragile material will not only provide long time preservation but also offers the users to find, retrieve, study and manipulate the information in a colorful environment.

Modern multimedia technology is playing a major role in preservation and promotion of cultural heritage, by digitizing all forms of materials, text, visual, audio/video moving pictures etc. together to represent the holistic form. The World Wide Web is wide reaching medium through which anything and everything could be made available to anyone and everyone around the globe, in fastest way.

2. Digitization of Manuscripts

India has one of the largest and oldest collections of manuscripts in the world. To day the Palm leaf books, paper manuscripts, birch bark texts, drawings, paintings, art and sculpture etc. are either scanned or converted into analog material and are preserved on long lasting digital media for the use of future generations. The most important benefits of digital preservation are:

- ✍ Preservation : Digital reproductions are virtually immortal in the sense, by reproducing multiple digital copies and by putting them for use the originals can be protected. By digitizing the manuscripts, the information can be preserved for a long time on digital media. The paintings and photos etc. of rare manuscripts can be enlarged and reproduction in the colorful environment is possible with digital technology.
- ✍ Dissemination of Information : Most of these manuscripts are stored in museums, libraries, temples and Mutts etc. with a restriction to use them. The digital preservation is not only safeguarding the original documents, but also providing these documents for information dissemination and research purpose via internet and CD-ROM etc.
- ✍ Transcend Originals : Digital imaging promises to generate a product that can be used for purposes that are impossible to achieve with original resources. It uses special lighting to draw out details obscured by aging, use, and environmental damage. Imaging, which makes use of specialized photographic intermediaries or by imaging at high resolution the study of artifactual characteristics has become possible.
- ✍ Collection Management : Digital preservation provides assistance in retrospective cataloguing, researching, assistance with curatorial functions, managing material movement etc.
- ✍ New Revenue Streams : By making available the digital reproductions at lower resolution to scholars as a paid service, sale of high quality posters to art patrons around the world via an e-commerce web site it is possible to generate some revenue.

3. Preservation of Manuscripts in India

Even under the best possible conditions, the physical preservation of manuscripts is a difficult task. The cultural heritage of India, in the form of manuscripts has to be conserved, preserved and documented. With this motivation, from ancient times preservation of manuscripts is done by indigenous methods like wrapping the manuscripts in silk cloth. Some times oil extracts of some natural products, sandal wood powder, black pepper, clove oil etc. are used for preserving palm leave manuscripts. Chemical treatments like, fumigation chambers and Thymol, Chloromate solution are also used to protect the manuscripts.

The Photographic methods, like microfiche, microfilming, photocopying are very important techniques of preservation and access. This method not only may damage the originals but preserve them only for a few decades.

The invention of Scanners has revolutionized the input of data to computer media, which can also damage the manuscripts. Then high-definition film scanner is used to digitize the manuscript as image, which is an expensive method. Before 1998, digital cameras were used, which could copy only a few pages and turns out to be quite expensive.

From 1999, improved still cameras are used to meet the needs of in-house digital copying. National Institute of Advanced Studies (NIAS) used this method by digitizing Bhagavad Gita into two CD-ROMs. The availability of Bhagavad Gita in digital form and its inclusion in computer database has rendered its access through Internet.

NIAS started a new method of preservation called NiDAC, to share the rare manuscripts via the Internet or CDs, for educational and research purposes. Instaed of using a scanner to digitize each page as a computer graphic, the NiDAC procedure begins with the DV video format. The DV video format simply records everything in binary code onto a mini DV tape. The Camcorder connects to high end computers via an IEEE1394 cable and card. The digital image can be manipulated as a graphic or converted into alphanumerical list. Images will be compressed into JPEG image formats and the computerization is completed with various forms of storage like rewritable media, CDs etc. The NiDAC also used a mega-pixel digital still camera with extra large memory cards and this method is one of the cost effective methods and it is ten times faster than downloading via a parallel or serial cable. This method is superior to the DV digitization and also works for extended field trips to archives, if a laptop or a computer with adequate storage is available. The NiDAC procedure allows in house copying of acid paper books such as yellowed and crumbled books. In the NiDAC procedure, DV (Digital Video) video format simply records everything as binary code on to a mini DV tape. DV digitizing method can be utilized for work in remote archives for extended times with no computer access and uncertain power supply etc.

4. Role of National Library of India

The National Library of India, located in Kolkata is collecting, disseminating and preserving the national heritage of the country. Digitization of manuscripts is one of the initiatives the library has taken up with its own holdings. The National Library of India holds the following manuscripts:

✍	Paper manuscripts	3,000 volumes
✍	Correspondence and diaries	250 volumes
✍	Palm leaf manuscripts	334 volumes
✍	Persian	955 volumes
✍	Arabic	681 volumes
✍	Bengali	168 volumes
✍	English	255 volumes
✍	Hindi	5 volumes
✍	Tamil	370 volumes
✍	Sanskrit	790 volumes

100 volumes of Xylographs, comprising more than 800 items (which are presented by honorable Dalai Lama) are block prints made from the bark of rare Nepali trees. The Arabic and Persian manuscripts bear beautiful illustrations, fine calligraphy and elegant binds.

As a sample project the Persian manuscript *Tutinamah* was chosen by the National Library for digitization. This manuscript consists of well known 52 tales of a parrot written in Indian Taliq within gold and color ruled borders and contains colored illustrations made through vegetable and organic dyes, on a hand made paper.

5. The Process of Digitization

The National Library of India carried out the digitization project in two operational areas. They are

Image Capture Station : The Image capture station consists of a digital camera (Nikon D100 with Bayonet mount 28-70mm f/2.8 ED-IF AF-S Zoom-Nikkor lens) mounted vertically on the photographic copystand with side illumination through 40 watts incandescent lamp. The digital camera had special colorimetric filters that enabled the camera to capture a broader spectrum of colors than the scanners.

Image Processing Station : It is a HP Brio Pentium – IV processor, having image processing software like, Kodak, Imaging, Adobe Photo shop –6 etc. The image transfer device, which is connected to the USB port, gathers images from the memory card of the digital camera.

Process : While taking care of the condition of the document, page number orders etc. the lighting is adjusted using light meter.

Image capture : The images were taken for all right handed side pages first, and then left handed pages, in color as uncompressed 8 – bit per channel (24 bit RGB) TIFF files at 300 dpi.

The Image processing

The images were first transferred to the image processing station, where they were renamed as per the page sequence and checked for their quality with the originals. Later they were edited and converted into three basic formats like PDF (Portable Document Format), which can describe documents containing any combination of text, graphics and images in a device independent and resolution independent format, TIFF (Tagged Image File Format), which is a file format used for still – image bitmaps, stored in tagged files) JPEG (Joint Photographic Exports Group). The JPG file is small and compressed by 90% of the original size. Finally, the manuscript is put in E-Book Format, in which the PDF image files were tagged and a composite PDF file is prepared as per the original document pagination and sequence. The composite PDF containing the individual pages were in E-Book form, with the object of access. The images were stored in CD-ROM and were made resident in hard disk of the central server.

6. Manuscript Resources of India

✍ Total number of Manuscripts in India	5,000,000
✍ Indian Manuscripts available in European countries	60,000
✍ Indian Manuscripts in Asian countries	150,000
✍ Percentage of manuscripts in Sanskrit	67%
✍ Percentage of manuscripts in other Indian languages	25%
✍ Percentage of manuscripts in Arabic /Persian/Tibetan	8%
✍ No. of manuscripts recorded in catalogue	1,000,000

Out of these Indira Gandhi National Center for Arts (IGNCA) has 2,50,000 manuscripts, Indian National Trust for Art and Cultural Heritage (INTACH) has surveyed more than 300 sites in 3 districts and prepared an inventory of 47,000 palm leaf and paper manuscripts.

7. Mission for Digital Preservation of Manuscripts

The National Mission for manuscripts was launched by the Department of Culture, Ministry of Tourism, Government of India, with the Indira Gandhi National Center for Arts as the national nodal center to save the India's most valuable heritage. It selected four agencies for digitizing manuscripts in 5 states of India. They are :

1. NIC, New Delhi, Illustrated Manuscripts of Orissa.
2. MSP, Bangalore, Siddha Manuscripts of Tamil nadu.
3. CDIT, Delhi, Kuddiyattam Manuscripts of Kerala
4. CIL, New Delhi, Kashmir Manuscripts of Ikbal Manuscript Library.
5. NIC, New Delhi, Vaishanava Manuscripts of Majuli Island, Assam.

8. Manuscript Resource Centers

The Mission has selected 24 Manuscript Resource Centers (MRC) in the country for coordinating its activities pertaining to survey and documentation of manuscripts. These centers are registered libraries, museums, oriental institutions, universities etc. with considerable manuscript holdings and necessary infrastructure to provide support for survey, documentation and digitization of manuscripts. Strategies for cataloguing, preservation and storage of manuscripts is drawn in consultation with the experts and evolved a standard format for the preparation of a comprehensive national electronic registration of manuscripts.

9. Manuscript Conservation Centes

The mission has identified 15 Manuscript Conservation Centers (MCC) all over the country as nodal centers for preservation and conservation of manuscripts. MCC are to provide training in preservation and conservation, taking up the task of conservation of manuscripts in different institutions, work for introducing the new technologies for conservation of manuscripts. Some of the MCCs are:

- ✍ Indira Gandhi National Center for Arts, Delhi
- ✍ Orissa Art Conservation Center, Bhubaneswar
- ✍ Rampur Raja Library, Rampur, U.P
- ✍ Saraswati Mahal library, Thanjavur
- ✍ Salarjung Musuem, Hydarabad
- ✍ Khuda Baksh Library, Patna
- ✍ Rajasthan Oriental Research Institute, Jodhpur
- ✍ Oriental Institute, M.S. University, Baroda
- ✍ INTACH, Chitrakala Parishat, Bangalore
- ✍ Bhandarkar Oriental Research Institute , Pune. Etc.

All these centers are well equipped with conservation laboratories and have expertise in providing conservation and preservation services for manuscripts.

National Electronic Register: The mission started for evolving a National Electronic Data base of manuscripts, which integrates information regarding different aspects of manuscripts like, type of material, script, language, subject, place of availability, illustrations, number of pages etc. The database integrates information regarding the organizations with their manuscript holdings, catalogues in the country and abroad, along with the bibliographical details of the manuscripts. National Informatics Center prepared the software and data for 20,000 manuscripts are entered in the database. A copy of the software is given to MRCs and the work of entering the Meta data is started in these centers.

10. Institute of Asian Studies Project

A study by Institute of Asian Studies, Madras indicates that there are about one hundred thousand palm leaf manuscripts, in Tamil language in south Indian Repositories and are lying in a destroyed shape. These manuscripts are related to subjects like Siddha, Ayurveda, Yunani, Human anatomy, Art & Architecture, Temple art, Ship building, Carpentry, Metal working, Astrology & Astronomy, Yoga, Martial arts, Physiognomy etc. The institute deputed a team of highly qualified specialists for the task of preservation of these manuscripts. As a first step the team identified, collected and conserved the manuscripts and then microfilmed and preserved the manuscripts. In the second step, these manuscripts are translated, edited and catalogued.

Digitization : An international team of scholars from Germany, University of Cologne, University of Berkeley, U.S.A, are working in collaboration with Online Tamil Lexicon project, to digitize the manuscripts and after digitization, they will be disseminated as online databases, CD-ROMs and conventional publications as books.

11. Digital Preservation Requirements

Digital preservation encompasses a broad range of activities designed to extend the usable life of machine readable computer files and protect them from media failure, physical loss and obsolescence. Digital preservation will add little values to the research process if it serves only as an alternative form of storage. Preserving digital materials in formats that are reliable and usable will require long term maintenance of structural characteristics, descriptive Meta data, display and computational and analytical capabilities, which demand mass storage and software for retrieval and interpretation. The digital preservation is a process that requires the use of the best available technology, careful thought, administrative policy and procedures.

12. Conclusins

Preservation of manuscripts is not new in India. Along with traditional methods of preservation, modern techniques of digital preservation are also adopted. The Government of India is trying to preserve its cultural heritage by proposing strategies and policies at national level. By giving the responsibility of the conservation and preservation to National Library, National Informatic Center, National Archives and many individual libraries and information centers in the country. But the invaluable manuscripts of India are scattered among libraries, museums, temples, individuals etc. of the country and aboard. Therefore, it is the responsibility of each of these institutions to preserve them with modern digital technologies. The present technology and available expertise is enough to digitize the existing manuscripts, but one of the important limiting factors is motivation and monetary support, which should come from private business houses, religious bodies and individuals and a system of sharing the benefits should be worked out among owners of manuscripts, sponsors and universities.

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