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DIGITIZATION OF MANUSCRIPTS IN INDIA: CHALLENGES AND INITIATIVES

Manas Das

Librarian, Ramakrishna Mission Vidyamandira, Belur Math, Howrah

*For Correspondence: *tmanas.das12@gmail.com*

ABSTRACT

The world's greatest collection of rare manuscripts may be found in India. It has a lengthy historical background in practically every field, including ancient knowledge, literature, mathematics, music, philosophy, science, and law. These manuscripts, which were written in a variety of languages and scripts, offer glimpses of the magnificent Indian cultural history that dates back several centuries. In the digital age, libraries have incorporated technologies into their daily services. Libraries change their role to shift physical resources to electronic resources. However, manuscripts remain a primary source of information. The manuscript must be preserved for future use. To ensure their safety and accessibility for use, the government of India has taken some initiatives to create digital archives of manuscripts. In this paper, we discuss the essential components of digitization and preservation of manuscripts.

Keywords: Manuscripts, digitization, preservation, NMM.

1. INTRODUCTION

At the beginning of the time, historians studied history and wrote the manuscript. Manuscripts were the only source of knowledge of ancient Indian history. The term "manuscript" can also refer specifically to handwritten documents, especially those that are older or historic in nature. In those contexts, manuscripts are highly valued for their historical, cultural, and linguistic significance as part of the world's heritage. In earlier times, scripts were written on leaf, bark, metal, cloth, and paper in various languages. Sometimes it's a work of art. As a result, manuscripts are a great national asset. For this reason, manuscript preservation and conservation are our prime duties. This priceless wealth is stored in libraries, museums, and archives. The library plays a crucial role in the collection of manuscripts and their digitization for preservation for future use.

2. OBJECTIVES OF THE STUDY

- To know the current status of manuscripts in the libraries.
- To know the status of digitisation and preservation of manuscripts.
- To know about the techniques used for digitisation and preservation of manuscript.

- To acquire knowledge about the digitization and preservation of manuscripts.
- To know about the government's initiatives for the digitization and preservation of manuscripts.

3. MANUSCRIPTS WERE PRODUCED IN ANCIENT TIMES

An essential component of India's rich cultural heritage are manuscripts. These are the primary archives for the contributions made by our ancestors to the various disciplines of science, medicine, literature, astronomy, and religion. They serve as the main data point for reconstructing India's past. Manuscripts are a rich source of knowledge since they preserve our civilization's history, literature, language, and other cultural aspects. It is significant for the study of Indian history, culture, and civilization in the classroom. Manuscripts are a sort of resource for study and research that may be found in many ancient libraries, notably those connected to institutions of Indological studies around the world. These institutions have Oriental architectural designs, and their libraries are Oriental libraries. The rare and important primary sources of information, culture, and human progress found in manuscripts make them the most precious records.

In ancient times, people used language to understand or write on following materials

- Stone: Writing on stones was carved into coves, pillars, slabs, caskets, and other flat or rough surfaces.
- Palm leaf: After being processed, palm leaves are sliced into the appropriate sizes and their surfaces are wiped with conch shells or stones before being used for writing. Then, the leaves are first dried, boiled, and then again dried in sunlight. When these procedures are finished, the palm leaf is prepared for writing. A metal stylus or ink pen is used for actual writing.
- Birch bark: In the past, writing was done on bricks, pottery, and other materials. Before drying or baking, they are typically scraped.
- Papyrus: When it was first used by the Egyptians, their revealed fibre brush pen, this writing surface created from the papyrus plant's marrow was smooth enough. It readily absorbed this crimson iron oxide ink and carbon black ink, keeping the pigments for a very long time.
- Bhoj patra: The Bhoj Patra manuscript is a type of paper made from the bark of the Himalayan birch tree. It has been traditionally used in India for writing important documents, particularly in ancient times. The name "Bhoj Patra" is derived from the name of the famous Indian king Raja Bhoja, who was a patron of literature and is said to have used this type of paper for his writings.
- Cloth: In ancient India, cotton cloth that was smooth and impermeable was also utilised as writing paper. The first person to mention that Indians used to combine letters on velt-beaten cotton material was Nearchos, an admiral of Alexander's fleet in the fourth century BC.

- Vellum and parchment: Unfortunately, the terms parchment and vellum are frequently used synonymously. Real vellum is made from the skin of a young, often under six-week-old calf that has been painstakingly scraped and polished, cleaned of any attached flesh, hair, fat, or muscle, and preserved by soaking in a lime solution.

  But, the skin of other animals is occasionally used as well. Sheep, ewes, or lambs' skins are typically utilised to make parchment. For pricey bindings and opulent manuscripts, craftspeople have always chosen vellum. Manuscripts of lower grade were bound with parchment.
- Metals (bronze, copper, gold, etc.): Man has utilised metals for both decorative and recording purposes. Brass, copper, bronze, and lead are the metals utilised for virtual reality. Lead is soft and tarnishes quickly when exposed to air, but it is less affected by ageing and the elements than most metals.
- Paper: Before the 11th century A.D., paper as a writing medium was hardly used in India. Chinese convicts created paper for the first time in China, which they then introduced to Samarkand. From there, paper production spread to other locations. India began using paper for writing purpose regularly in the 13th century.
- Leather: Animal skin preserved by tanning after being stripped of its fur and flesh was the most popular covering for barks up until the 19th century. For at least two thousand years, skins were treated with extracts from the bark of plants, typically oak, sumac, or hemlock, to produce vegetable-tanned leather. The entire process of washing the hides, losing the hair in lime pits, scraping off the epidermis, hairs, and flesh, soaking in bark solutions, and then drying, finishing, colouring, polishing, and graining, among other steps, was modified by the chemicals in the bark solutions combining with the protein fibres of the skins, replacing the water.

4. TYPES OF MANUSCRIPTS

- **Tal-patra Manuscripts (Palm leaf):**

  Tal-patra manuscripts are typically found as bundles of 50 to 100 evenly spaced, nicely shaped leaves that have been bound between two wooden boards using a string. Moreover, some collections have carpet-like-rolled, metre-long uncut leaves with unbroken midribs. The majority of India's coastal states, where the Palmyra palm tree often grew, are where one may find Tal-Patra manuscripts, yet collections of these texts can be found all across the country in households, matha, granthagar, libraries, research centres, archives, and museums.

- **Bhoja-patra Manuscripts (Birch bark):**

  Bhoja-patra manuscripts are typically displayed as a sheaf of uniformly sized, paper-thin "folios." Although often maintained piled up between two wooden planks and then covered with fabric, these are occasionally held together with string on the edges. Although there are collections spread throughout India, bhoja-patra trees and manuscripts are most commonly found in the Himalayan belt's moderate and alpine climate zone.

- **Hansi-pata manuscripts**:

  Which are similarly produced from the bark of the Agaru tree, are typically displayed in a sheaf of uniformly sized 'folios'. Rarely are these linked together; instead, they are frequently stacked up between wooden planks and covered with fabric. Hansi-pata texts are primarily discovered in the state of Assam in the northeast. Hansi-pata texts are not widely dispersed outside of that area throughout the rest of India.

- **Handmade Paper Manuscripts:**

  Handmade paper manuscripts are typically bound as books, but they can also be found as bundles and sheaves of individual folios sandwiched between wooden boards and fabric. All around the nation, manuscripts on handmade paper can be found.

- **Manuscripts on manufactured paper:**

  There are also several manuscripts on folios of contemporary manufactured paper. Once more, these are bound or kept loose. In all regions of India, particularly in the many archives and museums devoted to contemporary authors and other historical figures, manuscripts on machine-made paper can be found.

5. REASONS FOR DETERIORATION OF MANUSCRIPTS

There are several reasons for the deterioration of manuscripts over time. These include:

- **Environmental factors:**

Manuscripts can be damaged by environmental factors like light, heat, moisture, and so on. So, it can lead to tears, stains, and other types of damage.

- **Biological Factors:**

  Insects like cockroaches, silverfish, lice fungus, moulds, rat etc.

- **Climate Factors:**

  Natural Disasters (Flood, Earthquake, Fire, etc.)

- **Ink erosion:**

Ink is the deterioration of manuscripts. Earlier, iron gall ink was used in manuscripts, which can corrode the paper over time and cause text loss and structural damage.

- **Chemical factors:**

Paper and metal are made up of organic materials, which over time are damaged, fade, and lose their text.

- **Age:**

It is the primary information about ancient age. It is the older document than other documents. After a long time, it will break down, leading to deterioration.

- **Handling and use:**

It is also damaged by improper handling and use of folding, tearing etc.

Indigenous materials for manuscript preservation:

- Pieces of dried ginger or Vasambu are kept with bundles of manuscripts to protect them from insect attack.
- To protect the manuscripts from insect assault, aswagandha leaves that have been dried and ground up are put with them in little packages.
- Lemon-grass oil is applied as a coating to fortify manuscript leaves and eradicate microbial growths.
- Vermillion or the red fruit powder known as kumkum, which is used in certain regions, are also excellent insect repellents.
- The flexibility of the palm leaf manuscripts is restored with the help of oil extracts of several natural items, such as black pepper, sandalwood, or clove.
- It is known that the combination of neem leaves, karanja, nirgundi, and citronella has insecticidal characteristics, making it suitable for usage in manuscript libraries.
- Ants and cockroaches are also deterred by mint leaves.
- To keep insects away, many libraries frequently use sandal wood dust.
- It is widely known for its anti-infective properties of turmeric paste applied to seasoned palm leaves.
- An insect repellent that also has a potent aroma is black cumin (Kala Jeera). Insects are kept at bay by scattering seeds near the document storage.

6. NEED OF DIGITIZATION OF MANUSCRIPT:

In the area of data storage, digital technology has revealed a fresh viewpoint. There are millions of websites on the World Wide Web, and information gathering, sharing, expression, publication, and research are now completely integrated into and totally reliant upon the Internet. When it comes to cataloguing and data processing, libraries and archives are society's main sources of information. A large number of libraries today have shifted to developing digital substitutes from their

existing resources in addition to maintaining and offering access to "born digital material." Digital information that is standardised, organised, and readily available on demand is acquired, converted, stored, and provided through digitization.

To prevent the deterioration of manuscripts, it is important to store them in digital files. Manuscripts must be digitised and preserved in the digital age. Digitization provides a way to preserve their context without risking damage to the original one.

- **Accessibility:**

Because there is no risk of tearing or fading the original documents, digitising them makes them more accessible to users.

- **Search ability:**

For digital files of manuscripts, it is easy to search the database of context and quickly and easily find specific keywords, saving the user time.

- **Sharing and Collaboration:**

Digitization of context is to discover as well as new ideas from researchers.

- **Cultural Heritage:**

Manuscripts are documents of historical origin that represent our nation's cultural heritage. So, we need it for digitization for future use.

7. ESSENTIAL COMPONENTS TO DIGITIZATION OF MANUSCRIPTS

The digitization and preservation of manuscripts need some key components:

- **Rescue:** First, rescue the original manuscripts to save the documents lives.
- **Scanning:** Scanning the original physical manuscripts by high-resolution scanners
- **Image Processing:** After scanning, the image is processed to enhance its quality.
- **Metadata Creation:** Metadata is descriptive information about documents. So, it is searchable by any type of keyword.
- **Optical Character Recognition (OCR):** OCR is a software that is used to convert the scanned text and image into searchable and editable text.
- **Digital Preservation:** It involves storing the digital files of manuscripts.
- **Online Access: It is** made available online through a website or digital library. So, users can easily access it at anytime, anywhere.

8. MANUSCRIPT ARCHIVING ISSUES AND CHALLENGES

Archiving of manuscripts can face many challenges and issues.

- **Lack of Standardisation:**

  Manuscripts were older documents. So, there is a problem with maintaining the standardisation of the digitization of manuscripts. It is difficult to understand spelling, punctuation, abbreviations, etc.

- **Multiple Languages:**

  Manuscripts written in many languages add another level of complexity to the archiving process.

- **Large Volume Data:**

  Many manuscripts are large in size. Therefore, it is difficult to archive.

- **Copyright and Ownership Issues**:

  Digitization of original documents in manuscripts raises issues of copyright and ownership.

- **Technical Issues:**

  A lack of technical issues is a big problem with archiving manuscripts.

- **Funding:**

  It is another problem of manuscript preservation.

  Government of India Initiatives for Digitization and Preservation of Manuscripts

  To digitise and preserve manuscripts, the Government of India has taken a few initiatives.

- **National Mission for Manuscripts:**

  The National Mission for Manuscripts (NMM), a project of the Ministry of Tourism and Culture, Government of India, was launched in February 2003 with the goal of preserving Indian manuscripts. The collection is the biggest ever assembled. These missions deal with a wide variety of subjects, such as scripts, artwork, manuscript language, and so forth. "Conserving the past for the future" is Mission's catchphrase. The main initiatives taken are:

- **Bharatiya Kriti Sampada:**

  A nationwide database of manuscripts is called Kriti Sampada. It is accessible via the webpage on the Internet. The National Mission for Manuscripts was introduced on February 14, 2007, by Ambika Soni, the cultural minister. It is a large collection of manuscripts

- **Digitization of Manuscripts:**

A pilot project to digitise manuscripts was launched by NMM in 2004 and finished in 2006 as a digital resource base. By defining a trustworthy policy for digitization, this resource base was intended to preserve the abundance of knowledge contained in manuscripts. The third phase of NMM's digitization, which began in April 2015 and will end in 2017, involved digitising 2.53 billion pages from 2.11 lakh manuscripts.

- **Indira Gandhi National Centre for the Arts:**

The Indira Gandhi National Centre for the Arts (IGNCA) is under the Ministry of Culture, Government of India. It launched on November 19, 1985. It works as a major resource centre for arts materials, especially written, oral, and visual sources. It promotes a new area of research and establishes networks with national and international institutions. The main programmes of the centre are:

- **Kalanidhi:**

The Kala Nidhi is a collection of books, manuscripts, and artwork. A subscription to more than 250 scientific and technical periodicals is also available at this library, which has a collection of more than 1.5 lakh books in twelve languages, including some foreign languages. The library has been arranged scientifically in accordance with generally accepted criteria and is fully automated, making it simple for users to access its resources through the Online Public Access Catalogue (OPAC).

- **Conservation Lab**:

The lab is especially for the conservation of manuscripts, books, paintings, etc. in digital objects.

- **Cultural Informatics Laboratory:**

IGNCA founded the Cultural Informatics Lab in 1994. It serves as the major hub for digitising books, slides, audio, and video to protect the repository for the present and the future. The globe can access the materials created by Cultural Informatics via CD-ROMs, Kalasampada, and the IGNCA website.

- **Kalasampada:**

IGNCA established Kalasampada, a "Digital Library: Resources of Indian Cultural Heritage (DL-RICH)" in collaboration with the Ministry of Communication and Information Technology. The Digital Library includes over 50 lakh manuscript folios, 1 lakh slides, tens of thousands of images, IGNCA books, over 400 hours of audio and video cassettes, and over 50 walkthroughs in its collection.

- **National Library of India, Kolkata:**

The National Library of India is under the Ministry of Culture, Government of India. It is the largest library in India. It has divisions for manuscripts. It has digitised maps, calculations, etc. The library's key initiatives include:

- **Down Memory Lane:**

The National Library of India, Kolkata, has launched a digitization initiative called "Down Memory Lane" with the goal of digitalizing manuscripts, rare books, and other items in its holdings. The programme enables scanning of the original documents to produce digital copies that may be electronically saved and viewed.

- **National Digital Manuscript Library:**

This Digital Manuscript Library is an online repository that offers access to all information about human history as it appears in the manuscripts of our nation. In the grounds of IGNCA, there is a hybrid library called the National Manuscript Library that houses both an online and an offline digital collection. Only in the IGNCA building are digital collections accessible on the intranet. This library serves as a portal to Indian Digital Manuscripts Libraries in a variety of fields, including science, the arts, music, traditional medicine, the vedas, tantras, and many others. As a result, everyone will have access to a special resource, regardless of nationality or socioeconomic status.

- **Trusted Digital Repository (TDR):**

NMM will set up a Trusted Digital Repository (TDR) for the long-term preservation of digital manuscripts. Initially, the TDR will make 4 lakh manuscripts available. Academics and subject-matter specialists from many fields will need to read, study, and conduct in-depth research on the complete manuscripts. An advanced infrastructure and cutting-edge software must be installed by the NMM in order to enable a distributed system of digital archives. For this aim, a reliable institution that can vouch for the veracity of a digital collection of manuscripts must also be chosen.

- **Khuda Bakhsh Oriental Public Library:**

Another National Library of India branch is located in Patna, Bihar. It is run by a board that includes the governor of Bihar and is an independent organisation under the Ministry of Culture of the Government of India. The Mission for Manuscripts has classified the library as a Manuscript Conservation Centre (MCC). There are 35,000 manuscripts. 14000 tiny manuscripts are currently being digitised, and 21,000 are uncommon collections.

- **The Rampur Raza Library:**

The Rampur Raza Library is a repository of Indian Islamic knowledge and creativity. Nearly 17,000 manuscripts, 60,000 printed books, nearly 5,000 miniature paintings, 3,000 rare examples of Islamic calligraphy, and Nawabi artefacts are among the library's holdings. Additionally, it contains nearly 1500 rare gold, silver, and copper coins dating from the fifth

century B.C. to the nineteenth century A.D., as well as centuries-old astronomical instruments. The library is also quite well-stocked with rare ancient and Mughal artefacts. Additionally, it contains a collection of palm leaf manuscripts written in Tamil, Telgu, Kannar, and Malayalam.

- **Digitization:**

  A reputable company from New Delhi contracted out the digitization process, and they produce digital photos at a resolution of 300 dpi in the form of JPEG and TIFF files, as well as backup DVDs. The library intended to digitise 25,000 pages in the first phase, but only 14,00000 of them have been completed, covering the years 2006 to 2012.

- **The Asiatic Society:**

  Sir William Jones, a brilliant scholar and Supreme Court of Bengal judge, founded the Asiatic Society in Kolkata on January 15, 1784. It is an independent organisation that reports to the Indian government's Ministry of Culture.

  More than 15,000 pages have already been digitised as part of the Society's internal programme to digitise manuscripts, rare books, and other archive documents since 2011. 6750 pages, 48 manuscripts, 1 album, 3 rare volumes, and 5 plates in total have been digitally preserved this year.

- **Manuscripts Conservation Programme:**

  The National Archives of India started this programme in 2013 to protect and preserve the manuscripts under its care. It is built using top-notch technologies to ensure the longevity of manuscripts.

- **Microfilming:**

  NAI microfilmed the entire collection of documents in order to generate a reproduction of the original manuscripts for the purpose of conserving the nation's cultural history. To stay up with the changing environment in the information technology industry, NAI has been converting analogue microfilm images to digital since 1998 and integrating those changes with the metadata of its record holdings.

- **Digitization of Rare Manuscripts:**

  A pilot project for the digitization of rare manuscripts was launched by NAI in July 2000 in association with the Department of Science and Technology and the National Institute of Advanced Studies, Bangalore. Rare manuscripts including the Bhagwadgita, Ramayana, and Mahabharata have been digitally preserved and kept on CD format.

- **National Digital Library of India:**

  This is a digital library that contains books, manuscripts, and other educational materials in a variety of Indian languages. All of India's digital resources are accessible through a single window.

  Through these initiatives, thousands of Indian manuscripts have been preserved and digitally preserved for use in the future and India's cultural heritage.

9. CONCLUSION

The process of making a digital version of a manuscript is known as digitization and preservation. Manuscripts are significant historical artefacts that reveal a nation's culture, history, and literature during specific eras. Whereas the original manuscripts were created by hand, it is necessary to preserve them using technology for use in the future. This procedure makes it easier for more people to use manuscripts and learn about the social and cultural conditions of the time.

Manuscripts are being digitally preserved for convenient access and new research areas. For long-term storage of the original manuscripts without risking damage or fading of the documents, digitization and preservation are needed. Government of India steps done to safeguard the use of and prolong the life of original manuscripts.

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