

# Digital Preservation & Access to Cultural Heritage Resources in India: A Review

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## Abstract

India has a variety of cultural heritage resources which are available in different formats. But the preservation of these resources is a serious problem. The present study was conducted to explore process of digital preservation of Indian cultural heritage collection available in different forms. In digital era Internet and digitization have offered new opportunities for providing effective and more extensive digital preservation & access OF CHRs, however, they have also brought new challenges for it. Review of the study reveal that various institutions in India are digitizing their heritage collection for preservation and access to future generation.

**Keywords:** CHRs, Digitization, Digital Preservation, Metadata, TKDL

## Introduction

In the present digital era with the advances in technology, we are encountering a radical change in our information and knowledge establishment. Most of the information and knowledge generated today is in digital formats. However much of the world's cultural heritage resources are being preserved by Libraries, museums and archives collectively termed as memory institutions. These memory institutions are also taking up projects for digitization and analog materials to preserve and provide future access to historical and heritage resources contained in their institutions. Many of these digitized resources are made available on the internet by these institutions. According to Ruthven & Chowdhury memory institutions have long been involved in managing cultural heritage information resources. However, the access and utilization of such resources is restricted due to so many reasons like the nature of the resources and problems associated with preservation issues [26].

In the current scenario due to the emergence of ICT, there are now opportunities for making digital contents of cultural heritage resources (CHR) that might be accessed from any place within the world. Hence, there are a number of ongoing projects for digital preservation of heritage information for example, Ohio Memory- A Collaborative Project of the Ohio History Connection and the State Library of Ohio and Arizona Memory Project by Arizona State Library, Archives and Public Records.

With the continuation of digitization, the main objective of digitization of CHR is to share and make them accessible and its related information in a good, productive, quick and supportive manner in relation to networked environment to produce and disseminate information regarding the same. Alkhoven stated that "Many cultural heritage institutions are starting to digitize parts of their collections for better accessibility, openness, protection and preservation of originals, advancement and visibility of the institution on the Internet etc. Viewing other cultural heritage foundation's exhibiting their accumulations on the Internet, the pressure is high to do likewise." (Alkhoven, 2005)

## Aim of Study

The purpose of the study is to identify the various initiatives of digital preservation of Indian cultural heritage and issues relating to the accessibility of the cultural heritage of India Study has also revealed issues and challenges in digital preservation.

## Cultural heritage resources & Digital Preservation

### Cultural Heritage

Heritage is explained in UNESCO as "Our legacy from the past, what we live today and what we pass on to future generations. A heritage is something that is or should be, passed from generation to generation because it is valued." Cultural heritage, whether tangible or intangible are



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non-renewable resources, that one lost are gone forever. According to Cane and Conaghan the categorization of Cultural heritage is as follow:

“1. Tangible cultural heritage 2. Intangible cultural heritage

Tangible cultural heritage that are the material, and can be (a) movable objects, such as paintings, antiquities, or artifacts and (b) immovable objects such as buildings, monuments or archaeological sites; and Intangible cultural heritage that cannot be touched but which can be felt through other sensory organs- for example, can be seen, as in the case of a dance or performance of a play or rituals, or can be heard, as in case of music, stories etc.” (Cane and Conaghan, 2009).

#### **Digital preservation**

It was described by ALA as “Digital preservation combines policies, strategies and actions that ensure access to digital content over time.” (ALA, 2007). The deterioration of printed information, the lack of storage and infrastructure, and inadequate access to totally different archival collections has led to digitization. Conway notes, “It is very important to see clear distinctions between the terms ‘digitization for preservation’ and ‘digital preservation’” (Conway 2010,p. 64). Digitization is the conversion of traditional, analog materials such as books, maps, and other paper items into a digital format. Digital preservation is the conservation of all digital materials, whether or not they were born digital or digitized from analogue materials (Conway, 2010). Kumar Das, & Sharma defined digital preservation as “A process by which data is preserved in digital form in order to ensure usability, durability and intellectual integrity of the information contained therein is called digital preservation”(Kumar Das, & Sharma, 2009 p.35)

According to UNESCO “Resources of human knowledge or expression, whether cultural,

educational, scientific and administrative, or embracing technical, legal, medical and other kinds of information, are increasingly created digitally, or converted into digital form from existing analog resources” are known as Digital heritage. They embrace texts, databases, still and moving pictures, audio, graphics. These resources have lasting value so that they should be protected and preserved for current and future generations. Colin Webb, National Library of Australia, wrote in The Memory of the World Guidelines for the preservation of digital heritage “Digital preservation consists of the processes aimed at ensuring the continued accessibility of digital materials. To do this involves finding ways to re-present what was originally presented to users by a combination of software and hardware tools acting on data. To achieve this requires digital objects to be understood and managed at four levels: as physical phenomena; as logical encodings; as conceptual objects that have meaning to humans; and assets of essential elements that must be preserved in order to offer future users the essence of the object.”

India is the country which is known for its large collection of cultural heritage resources. So, it is important to preserve, promote and disseminate all styles of art and culture of the country for overall development in economic, social and research activities. The mandate of the Ministry of Culture (India) rotates round the capacities like preservation and conservation of our cultural heritage and advancement of all styles of art and culture, each tangible and intangible. The main task of ministry is to create and sustain various system & methods through which the innovative and aesthetic sensibilities of the general population stay dynamic and element (Ministry of Culture, Govt. of India). The Ministry of Culture lists the institutions responsible for preservation of CHRs is as follows:

**Table:1 CHR organizations as classified by the Ministry of Culture (India)**

<b><i>Tangible cultural heritage resources</i></b>	<b><i>Intangible cultural heritage resource</i></b>	<b><i>Knowledge Resource Heritage</i></b>
1. Archaeological Survey of India	1. National School of Drama	1. National Archives of India
2. National Museum	2. Indira Gandhi National Center for the Arts	2. Anthropological Survey of India
3. National Gallery of Modern Art	3. Sahitya Akademi	3. Gandhi Smriti and Darshan Samiti
4. Indian Museum	4. Lalit Kala Akademi	4. Nehru Memorial Museum and Library
5. Victoria Memorial Hall	5. Sangeet Natak Akademi	5. Indira Gandhi Rashtriya Manav Sangrahalaya
6. Salarjung Museum	6. The Centre for Cultural Resources and Training	6. Asiatic Society
7. Allahabad Museum	7. West Zone Cultural Centre	7. Central Institute of Himalayan Cultural Studies
8. National Council of Science Museums	8. North Zone Cultural Centre	8. National Library
9. National Museum Institute of History of Art, Conservation and Museology	9. South Zone Cultural Centre	9. Raja Rammohun Roy Library Foundation

10. National Research Laboratory for Conservation of Cultural Property (NRLC)	10. Eastern Zonal Cultural Centre	10. Delhi Public Library
11. National Mission for Monuments and Antiquities	11. North East Zone Cultural Centre	11. Rampur Raza Library
12. National Mission for Manuscripts	12. South Central Zone Cultural Centre	12. Central Reference Library
13. National Mission on Libraries	13. North Central Zone Cultural Centre	13. Khuda Baksh Oriental Public Library
14. Gandhi Heritage Sites Mission	14. Kalakshetra Foundation	14. Thanjavur Maharaja Serfoji Mahal Library
15. National Culture Fund	-	-

**Methodology**

The paper is based on the review of existing literature and concepts about digital preservation, management, and accessibility for cultural heritage. Study will be undertaken on the existing literature being used for digital preservation of cultural heritage resources and identify the issues involved in the process. Primary data will be collected from websites from institutions and annual reports etc.

**Digital Preservation of Cultural Heritage in Indian Institutions: An overview**

With the advancement in the information technology environment, Research and Development activities focusing on the management as well as access of digital cultural heritage information. At this time numerous on-line digital libraries on cultural heritage Information is available. Some of the digital preservation initiatives started around the world are discussed below:

**Traditional Knowledge Digital Library (TKDL)**

It is a joint project of the Council of Scientific and Industrial Research (CSIR) and the Ministry of Ayush. It was established in 2001. TKDL is an Indian digital repository of the existing literature about traditional medicinal plants and its formulations utilized in Indian systems of drugs. TKDL includes documentation of the traditional knowledge related to Ayurveda, Unani, Siddha, and Yoga, in a digitized format which is accessible out in public domain within the type of existing literature. It has also overcome the language and format barrier and accessible in five international languages which includes English,

German, French, Japanese, and Spanish. Scientifically, it is converting and structuring the available contents of the ancient texts on Indian Systems with the help of information technology tools and Traditional Knowledge Resource Classification (TKRC)

**Indira Gandhi National Center for the Arts (IGNCA)**

The Indira Gandhi National Centre for the Arts (IGNCA), established in the memory of Smt. Indira Gandhi in 1987 under the Department of Culture, Government of India and envisioned as a centre for research, academic pursuit and dissemination in the field of arts. Perceiving the need to incorporate and save the dispersed parts of Indian art and culture, a pioneering endeavor has been made by Indira Gandhi National Center for the Arts (IGNCA) to serve as a noteworthy asset community for expressions of the human experience, particularly composed, written, oral and visual materials. In this mission, Manuscript Resource Centres (MRCs) and Manuscript Conservation centres (MCCs) are established over the nation. The MRCs incorporates museums, libraries, Ideological institutes, universities and non-government, that function coordinating agencies in their several regions. The MCCs helps in preserving manuscripts for the assistance from claiming grants acquired under the national mission to Manuscripts ("Indira Gandhi National Centre for the Arts", 2016).

IGNCA has six functional divisions, which are described below:

**Table 2: A brief description of divisions under IGNCA**

S.No	Name of Division	Brief description about Division
1.	Kalanidhi (Reference Library of books, manuscripts and visuals)	Kala Nidhi act as a significant cultural knowledge resource center to support research activities and the technical information needs of other divisions of IGNCA. It acts as a is a reference library of IGNCA.
2.	Kalakosa (Research and Publication Division)sa	It is research and publication division of IGNCA, Committed primarily of the intellectual heritage in their extent of multi-layers and multi-disciplines. As a search and publication division, it endeavors to put the humanities among the integral framework of a cultural system, combining the textual with the oral the visual with the aural life and arts and theory with practiced. Publication series under kalakosa: ➤ Kalātattvakośa Series ➤ Kalāmūlāśāstra Series

		<ul style="list-style-type: none"> <li>➤ Kalāsamālocana Series</li> <li>➤ India &amp; The World</li> </ul>
3.	JanapadaSampada (Division for the study of diverse Living Traditions)	Division for the study of diverse Living Traditions manages lifestyle studies. It is a programmatic character ordered as lifestyle Studies, Multi-media Presentation, and Events.
4.	Kalādarśana (Division for Exhibition and Presentation)	Generally, gives the venue and forum for facilitating a creative dialogue among cultures, disciplines, levels of society and diverse arts. It has built up a unique style of projection and introduction of expressions of art through its program. Bal Jagat, the programme for children, comes under this Division's activities.
5.	Sūtradhāra (Division for Administrative Support and Coordination)	It is administrative division of IGNC. The main aim of Sutradhara is to provide the administrative support and services to all the Divisions of the IGNC.
6.	Cultural Informatics (Multimedia Research Center)	It acts as multimedia research center and informatics with technology tools for digital preservation of cultural expressions and artifacts. For cultural preservation and proliferation applied technology tools are used.

Digitization Projects Implemented by IGNC is Kalasampada: Digital Cultural Heritage (DL-RICH) National Databank Library Resources for Digital Library in on Indian Art and Indian Cultural Heritage Hindi (CHDLH) Culture ((NDIAC). There is collaboration of Visva-Bharati in Santiniketan, National Library of Mongolia, Ulaanbaatar, Allahabad Museum, Allahabad and three oriental institutions and manuscript libraries in Srinagar, specifically Oriental Research Library, Shri Pratap Singh Library and Allama Iqbal Library, with IGNC under its manuscripts acquisition programme for digitizing all their manuscripts collections accessible with them. (Das, 2008, p.213-214) Various turnkey digitization projects of IGNC are listed below:

Digitization Process of:

1. Paintings, photographs and rare manuscripts (Visva - Bharti, Santiniketan)
2. Manuscripts of Ganjuur and Danjuur (National Library of Mongolia)
3. Manuscripts from National Museum, New Delhi
4. Manuscripts of Sanskrit and Persian (Oriental Research Library, Srinagar)
5. Manuscripts from Shri Pratap Singh Library, Srinagar

6. To style and development, a web site for archaeological Survey of India (ASI), New Delhi and National Museum Institute (NMI), New Delhi

7. To present a report on Cultural Mapping of India underneath UNESCO's Programme on Cultural Industries and Copyright Policies and Partnerships ("Indira Gandhi National Centre for the Arts", 2016)

#### **National Mission for Manuscript (NAMAMI)**

It was established by the Ministry of Tourism and Culture, Government of India in February 2003. The aim of mission is to unearth and preserve the huge manuscript wealth of India. The National Mission for Manuscripts (NAMAMI) is a self-governing association under the Ministry of culture, Government of India. It is aimed to overview, find and preserve Indian manuscripts, with an intention to make national heritage enhancing its access, awareness and use for educational functions.

UNESCO built up the Memory of the World Program in 1992. The Memory of the World Register in some ways the most publicly visible aspect of the Programme was inaugurated on the 1995. The Memory of the World Register lists documentary heritage of different countries.

**Table 3.1: List of Indian initiatives of cultural heritage digitization included in UNESCO's Memory of the World Register**

S.no	Name of repository	Host institution	Types of heritage document
1.	The I.A.S. Tamil Medical Manuscript Collection	Institute of Asian Studies, Tamil Nadu	Manuscripts of ancient system of medicine practiced by yogis. (A collection of Tamil Medical Manuscripts )
2.	Saiva Manuscript in Puducherry	French Institute of Pondicherry Pondicherry	A collection of manuscripts mainly concerns with religion and Hindu God Shiva.
3.	Rigveda	Bhandarkar Oriental Research Institute, Pune	Rare manuscripts of India
4.	Tarikh-E-Khandan-E-Timuriyah	Khuda Bakhsh Oriental Public Library, Patna	Rare manuscripts, paintings

5.	laghukālacakratantrarājatikā (Vimalaprabhā)	Asiatic Society, Kolkata	Rare manuscripts about tantra mantra
6.	Shāntinātha Charitra	Indology, Ahmedabad	Text in Sanskrit written in Devanagari script.

### Current Issues & Challenges in Digital Preservation of Cultural Heritage Resources

Pandey and Kumar in their study concluded that many of the digitization projects are facing major problems such as, inadequate funding, lack of preservation policy and absence of technical infrastructure in case of digital preservation of cultural and heritage resources (Pandey & Kumar, 2020).

Bakshi in his thesis entitled "Organization and Use of Multimedia Resources in Indira Gandhi National Centre for Arts and DESIDOC, Delhi: A Comparative Study" analyzed that Technological obsolescence is a major barrier in digital preservation as many other old materials are facing technological obsolescence and there is no technological vision for digital preservation. Non-availability of skilled staff and copyright issues are other barriers in digital preservation. Bakshi suggested that digitization of documents should fulfill the openness and accessibility to all users, inside and additionally outside the library. But the lack of comprehensive catalog records is a big problem in locating the resources. Similarly, in case of cultural heritage resources retrieval of digitized materials is problematic due to lack of metadata standards. He suggested some metadata standard for cultural heritage resources such as CDWA, VRA core, and METS. (Bakshi, 2013)

Ambati et al. discussed a few issues and problems like procurement of books, duplication, data management, process and workflow, and architecture in a project like the DLI and shared their experiences in handling them. They reported that "Inaccurate metadata hinders fruitful search and retrieval of books, categorization and at the same time brings in scope for duplicate entries of the same book." they recognize that inappropriate metadata gives rise to difficulties in accessibility of resources. They expressed that the fundamental issue with inadequate and inaccurate metadata is hard to inquiry and recovery of the document and also duplication in records. (Ambati et al., 2006)

Dhansegaran clearly defines that "The Librarians and archivists must join together to develop action 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 to future generations." (Dhansegaran, 2004)

The libraries, museums, and archives are playing a vital role in preserving cultural heritage resources. No doubt many of the institutions have initiated the digital preservation of cultural heritage resources.

The major issue concerns about digital preservation are "What Should be Preserved or what are appropriate resources for preservation." These

resources must be proactively identified and preserved before they become obsolete. Following are the main issues and challenges in digital preservation:

### Changing Formats and Degeneration of Technology

Ever-changing digital technologies are big challenges connected with digital preservation because, it is uncertain that what formats or technology are going to be utilized in the coming era. According to Tennant Preservation strategies are necessary than the actual formats used, and in addition to that migration strategies for formats must be considered on priority basis (Tennant, 1999). Hence, digital preservation requires preservation of both digital material as well as technological standard.

### IPR and Copyright Issues

These are other obstacles in the digital preservation process. As some collections in institutions are gifted and some acquired from other libraries and museums, these couldn't be reproduced without permission. Therefore, institutions have digitized only that resources which are owned by them self, or prior permission is granted by the owner. In digitization of most of the in-house produced resources, therefore there is no copyright problem. According to Arora "IPR issues in the digital environment have implications not only on digital contents but also associated software. Long-term preservation and access may require migration of digital material into new forms or emulation of the original operating environment which may not be possible without appropriate legal permissions from the original rights owners of the content and underlying software." (Arora, 2006) The issue of the copyright of intellectual and intangible properties is the main obstacle in digital preservation.

### Standardization in metadata schema

Another key issue with digital preservation is the lack of metadata standard. In the case of long-term preservation of digital heritage resources metadata is a crucial component. Metadata use in digitization is often not standardized and causes duplication that is different variations of the identical word and description will cause errors. Evens and Hautekeete in their study on "Challenges of digital preservation for cultural heritage institutions" explain that when reflective on the digital preservation of cultural heritage resources, careful attention ought to be paid to their accessibility. For achieve this accessibility metadata system is required, the study found that almost all organizations do not use metadata system, which can result in the absence of consistency and standardization. (Evens and Hautekeete, 2011)

### Lack of funding

Funding is another essential emerging issue because digital preservation is an expensive process so it requires a sufficient amount of budget for

expenditure. But insufficient budget affects the process of digital preservation. Sufficient financial support needed to overcome this challenge in digital preservation. Maintenance and accessibility of digital resources require its hardware and software bring up to date. Anderson explained in his article "The primary ways available today of maintaining availability of old digital resources include 1) refresh (periodic copy of data from one storage media to another and possible data transformation between formats), (2) archive and maintenance of out of date hardware transformation, and (3) emulation (construction and maintenance of software that supports old and obsolete data formats)." (Anderson, 2004). All these activities require sufficient budget because these processes are costly in nature.

#### **Lack of trained staff and IT manpower**

Lack of trained IT manpower is a key issue in digital preservation. Another reason is the capacity of the existing staff should come to terms with those most recent developments in technology. They do not have adequate skills to work with new technology used in digital preservation. So, for overcoming this obstacle proper training is needed.

#### **Conclusion**

Presently, the Internet and digitization have offered new opportunities for providing effective and more extensive access; however, they have also brought new challenges for preservation, access, management and retrieval of information resources. Nowadays technologies involved in digital preservation are well acquainted however preservation during this digital era could be a difficult task for librarians and archivists. Digitization and digital preservation process facing some issues and challenges in order to make our valuable heritage resources accessible and its use in the future. Digital preservation helps us to increase the value of the resource. Digitization and digital preservation are the methods that will contribute towards providing wonderful services to the general public since it is capable of permitting the public to locate the resources quickly and comprehensively from anyplace at any time. Digital Preservation represents some massive challenges that need to be considered in the near future for better accessibility and conservation of valuable cultural heritage resources. At present, digital preservation plays an important role in access and management of resources so we need more research regarding issues and challenges for digital preservation of cultural resources.

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