
DIGITAL PRESERVATION OF ARCHIVES AND MANUSCRIPTS: AN INDIAN SCENARIO

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Abstract

Millions of documents in Indian Archives and approximately 5 million manuscripts written on various forms of writing material scattered throughout India are in urgent need of digital preservation. Paper manuscripts with the passage of time are getting fragile and brittle because of various reasons. Lamination or encapsulation does not seem to be a permanent solution of preserving the cultural heritage for the posterity. Advent of information technology and telecommunication has changed the scenario of preservation as well as dissemination of information of archives and manuscripts throughout the world. OAIS Open Archival Information System is the latest system claimed to be of international standard is being advised to be adopted for archives. India is a very rich country in ancient literature. However, this information is in various languages for which preparation of indigenous programs is essential. Role of National Archives of India and National Mission for Manuscripts has been discussed in detail.

Keywords: Digital Preservation/ Archives/ Manuscripts/ Digitization/ Cultural Heritage.

1. Introduction

Training courses offered by NAI need to be revised and courses like 'digital preservation', 'digital documents', 'digitization of manuscripts' 'Storage Techniques', 'On line Accessibility' etc. should be arranged at regional and university level. National Mission for Manuscripts(1994) is aiming at digitizing all the manuscripts and have a central depository. However, its terms and conditions of agreement need to be revised in order to make it successful.

Atmospheric control is one of the basic thing for digitization which we are lacking in Indian Archives and manuscript depositories. Placement of the databases in different forms at different geographical places is very essential.

There are a number of dangers to the 'digital documents', such as media, hardware, software, network failures; obsolescence of media, software & hardware; natural disaster; external attack; economic failure and organizational decline. UNESCO is continuously

emphasizing the significance of digital preservation of cultural heritage of the world in any form, for the posterity. Many of these sources having lasting value and significance should be protected as well as preserved. It aims that 'information should be for all'. Climate controlled storage facility, trained staff, timely checking of different types of digital medias, change of software or hardware whenever needed, regular power supply, regular users's orientation etc. are necessary for the proper upkeep of the 'digital documents'. Indian Universities, archives and manuscript repositories can digitize all rare documents at a nominal cost if there is an encouragement from the managements and authorities as well as initiative from the staff. Thus we will not be left behind in preserving the rare documents and manuscripts in digital form.

2. Digital Preservation of Archives and Manuscript

Albeit archives are centralised ones yet the manuscripts are scattered at various places within India as well as out side India. In India we have National Archives of India and nineteen state archives which possess millions of rare documents relating to different departments of the Centre and States. Pre-Independence documents dating back to 1748 are available in archives.¹ Archives have private papers, documents relating to different kingdoms ruled by kings during British Rule, rare books, maps, manuscripts, newspapers etc. Holdings occupy about 75,000 running feet of shelves in National Archives only.² National Archives has also record of 20 state agencies established by the British Government in order to have complete records of all principalities governed by Indian kings. ³

In addition to it we have about 50 lakh(5 million) rare manuscripts.⁴ All these documents need immediate digital preservation as the documents on the paper are becoming brittle and fragile day by day. So far as archives are concerned this information is available at certain places that too under Central Government or State Governments but the position of manuscripts is different as these are possessed by various types of institutions, universities, religious places and individuals.

'The greatest difficulty in digitization is its present availability, these can be in local temple or mosque, in a big library or state archive, in the private collection of an ex rulers or in the small village with an individual'. A large number of individuals in India have rare mansuscripts but they don't like to donate or sell to any institution which is capable to preserve the same with the help of latest techniques.

Digital preservation is the series of actions and interventions required to ensure continued and reliable access to authentic digital objects for as long as they are deemed to be of value.

Indian civilisation is as old as the other civilisations of the Orient. ⁵ Various types of formats for writing were used from time to time. The manuscripts written on cloth, palm-leaves, birch bark paper etc. need immediate digital preservation so that this valueable material may become easily accessible to scholars doing research at other places through on line. Time has come to get these get protected from perishing. ⁶

India has an excellent wealth of ancient literature, approximately 20% of total ancient world literature is in India.⁷ Before the establishment of National Mission for Manuscripts, National Archives of India was also looking after the manuscripts. Special grants to various types of institutions were given and are still being given for conservation, preservation and restoration of manuscripts. Training courses offered by NAI need to be revised and courses like 'digital preservation', 'digital documents', 'digitization of manuscripts', 'Storage techniques', 'On line Accessibility' etc. should be arranged at regional and University level. National Mission for Manuscripts is collecting the information of all manuscripts and even of those which were publically unknown to scholars and Universities.⁸ This effort is worth appreciation as a Central database of manuscripts can be prepared. Awareness among the general public about manuscripts is also being created.⁹

As most of the manuscripts are in the possession of individuals, Oriental and religious libraries, they are least interested to part away even with the digitized version of the manuscripts. Devotion, religious feelings and old attachment are other things associated with the manuscripts. Even to obtain a digital copy of manuscripts is not so easy. Catalogues prepared by universities are being ignored by NMM and new data sheets are being prepared.¹⁰ Repetition of noting down bibliographic description can be avoided. Such money can be utilized for preservation, conservation, restoration and digitization.

Guidelines for agreement with an institution by National Mission for Manuscripts as under are not acceptable to most of the institutions for digitization as no institution is ready to give the copyright to National Mission for Manuscripts. Moreover NMM takes the prerogative to publish or use the information as it may like which has not been liked by the educational institutions, oriental libraries, libraries attached to religious places, individuals etc. :

Sense of possessiveness of any rare document is a major drawback in India. Permission to have a complete digital copy may create some problems for a particular religion. Therefore, the managements and authorities become reluctant to give permission for full version, digitization or Xeroxing or Microfilming.

In India the manuscript repositories may have to face displeasures in some cases because of comments regarding other faiths. When 'Faith' is shaken the problem starts. Availability of full text of manuscripts freely accessible may produce counter results in some cases.¹¹

Print materials can survive for centuries and even millennia without direct intervention. In contrast digital materials may need active management and preservation in order to survive.

These digital repositories will require the basic infrastructure like computers, scanners, digital camera etc. Indian Institutions possessing such material can afford to have the basic infrastructure for digitization. There is no lack of computer professionals.¹² This material is not to be used by the architects or managers of these digital repositories but by teachers, researchers and scholars.

3. International Scene :

3.1 Latest Software for Archives:

OAIS :

It is an Open Archival Information System developed by the consultative committee for Space Data Systems and adopted as ISO 14721 : 2003. OAIS is meant for an archive, consisting of an organization of people and systems, that has accepted the responsibility to preserve information and make it available for a designated community.

This reference model addresses a full range of archival information preservation including ingest, archival storage, data management, access, and dissemination. It also addresses the migration of digital information to new media and forms, the data models used to represent the information, the role of software in information preservation, and the exchange of digital information among archives. It identifies both internal and external interfaces to the archive functions, and it identifies a number of high-level services at these interfaces. It provides various illustrative examples and some “best practice” recommendations. It defines a minimal set of responsibilities for an archive to be called an OAIS, and it also defines a maximal archive to provide a broad set of useful terms and concepts.

The OAIS model described in ISO 14721:2003 may be applicable to any archive. It is specifically applicable to organization with responsibility of making information available for the long term. This includes organizations with other responsibilities, such as processing and distribution in response to programmatic needs. 13

India is a multilingual country. Therefore, archives as well as manuscripts are in different languages which may not be able to properly use OAIS, and indigenous softwares will be required.

The archival records are used for various purposes and also as a resource material for a number of subjects and particularly for the study of history and historical trends in a particular period. Among all records being created in our public, semi-public and private organizations, paper-records still form the most common medium. Archival records are being laminated for preservation. 14 How far these will survive? Similarly our digitization program will need our continuous attention for making the infrastructure updated. We have seen longevity of paper but of electronic media it is yet to be seen.

Functional Model for an Archive:

- Ingest (Accession)
 - Archival Storage
 - Data Management : Meta data
 - Administration: Training and Education
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- Preservation Planning
 - Access
 - User's Satisfaction

Threats:

The following dangers can be anticipated to the digital Archives and Manuscript depositories.

- Media Failure: There can be change in storage media, every media is changing very fast thus during upgradation there can be irrecoverable bit-errors, disk crash and loss of off-line media.
- Hardware Failure
- Software Failure
- Communication Errors
- Failure of Network Services
- Media and Hardware Obsolescence
- Software Obsolescence
- Operator Error
- Nature Disaster
- External (Virus) Attack
- Economic Draught
- Organisational Decline

Archiving of digital information is the need of the times. But fast change of current technology is a problem for the developing countries. Organisational infrastructure is necessary to support it.

Migration

Migration the term as used in the context of Bacula, is a set of organized tasks designed to achieve the periodic transfer of digital materials from one hardware/software configuration to another, or from one generation of computer technology to a subsequent generation. The purpose of migration is to preserve the integrity of digital objects and to retain the ability for clients to retrieve, display, and otherwise use them in the face of constantly changing technology. Many number of migration tools that migrates data, applications and settings from one Source system to another Destination system. The process of migration is done by adopting simple methodology of installation, in less than the expected duration. In reality, not all the applications can be migrated to the destination system due to the operating system constraints that varies from 16.32 and 64 bit architectures.

Migration does not scale too well since migrations are done on a job by job basis. Thus if one selects a very large volume or a number of volumes for migration, he may have a large number of jobs that start because each job must read the same volume, they will run consecutively (not simultaneously).

4. Emulation

Emulation refers to the process of mimicking, in software, a piece of hardware or software so that other processes think the original equipment/function is still available in its original form. Emulation is essentially a way of preserving the functionality of and access to digital information, which might otherwise be lost due to technological obsolescence. One of the benefits of the emulation strategy compared with migration is that the original data need not be altered in any way. Once the data is archived with appropriate metadata and software, no other action is required apart from media refreshing until access is desired. One emulator can also be used as a solution for several data objects requiring the same operating environment. This should help to maintain the integrity and “look and feel” of the material. Emulator can create and use multiple virtual machines (VM) running a variety of Operating Systems (OS). Emulator refers real OS as the Host and the emulated OS as the Guest. Some emulators do not emulate an entirely different Processor/System. Only Operating Systems that run on Intel x86 versions of Linux, Unix and others, but few cannot emulate an Amiga or Mac for instance.

Diversity is very essential to preserve the digital documents. Some documents are born-digital whereas others are digitized. Most systems use off-line media to provide diversity in media for storing replicas, and to isolate some replicas as far as possible from network-borne-threats. We can have these at various Geographical places in order to avoid any catastrophe. Diversity of softwares will also be in the interest of any institution. 15

Any information dealing with particular time, place or person should be digitized in such a way that the user can access it and it should be authentic, authoritative, reliable and purposeful.

So far as cost-effectiveness is concerned we have already basic infrastructure in universities and archives. The only thing is the initiative from staff and management of libraries and Archives. The major libraries which are possessing a large number of manuscripts should start digitization as the manuscripts on paper are slowly and slowly getting deteriorated because of various factors such as environmental, micro biological agents, acidity, humidity, radiant energy, accidental agents etc. Now instead of lamination, encapsulation is being preferred.

5. Role of UNESCO

The digital heritage consists of unique resources of human knowledge and expression. It embraces cultural, educational, scientific and administrative resources, as well as

technical, legal, medical and other kinds of information created digitally, or converted into digital form from existing analogue resources. Where resources are “born digital”, there is no other format but the digital object.

Digital materials include texts, databases, still and moving images, audio, graphics, software and web pages, among a wide and growing range of formats. They are frequently ephemeral, and require purposeful production, maintenance and management to be retained.

Many of these resources have lasting value and significance, and therefore constitute a heritage that should be protected and preserved for current and future generations. This ever-growing heritage may exist in any language, in any part of the world, and in any area of human knowledge or expression.

The purpose of preserving the digital heritage is to ensure that it remains accessible to the public. Accordingly, access to digital heritage materials, especially those in the public domain, should be free from unreasonable restrictions. At the same time, sensitive and personal information should be protected from any form of intrusion.

The world’s digital heritage is at risk of being lost to posterity. Contributing factors include the rapid obsolescence of the hardware and software which brings it to life, uncertainties about resources, responsibility and methods for maintenance and preservation, and the lack of supportive legislation.

Attitudinal change has fallen behind technological change. Digital evolution has been too rapid and costly for governments and institutions to develop timely and informed preservation strategies. The threat to the economic, social, intellectual and cultural potential of the heritage- the building blocks of the future- has not been fully grasped.¹⁶

- a. urge hardware and software developers, creators, publishers and distributors of digital materials as well as other private sector partners to cooperate with national libraries, archives, museums and other public heritage organizations in preserving the digital heritage;
- b. develop training and research, and share experience and knowledge among the institutions and professional associations concerned;
- c. encourage universities and other research organizations, both public and private, to ensure preservation of research data.

Preservation of the digital heritage requires sustained efforts on the part of governments, creators, publishers, relevant industries and heritage institutions. In the face of the current digital divide, it is necessary to reinforce international cooperation and solidarity to enable all countries to ensure creation, dissemination, preservation and continued accessibility of their digital heritage. Industries, publishers and mass communication media are urged to promote and share knowledge and technical expertise.¹⁷

6. Climate Controlled Storage Facility

Digital Preservation requires climate controlled media storage facility. In India we face severe heat, dampness, cold atmosphere in North, humidity and stormy winds which are harmful to digital data, manuscripts and archives. Digital Section or Digital Library of archives and manuscripts should be fully air-conditioned. Provision for uninterrupted power supply is very essential. Any wrong attempt to preserve these digitized documents may jeopardise the whole exercise in vain. Controlled atmosphere is no problem in Indian Universities. State Archives can also afford this facility. Every digital library should follow one standard. National Mission for Manuscripts has prepared a standard Manus Sheet for the preparation of bibliographic description of manuscript. However, there should be full proof security for the protection of digitized material. The institutions should be capable enough to adopt the new techniques and software.

Environment control should be regularly checked. Staff should periodically inspect enclosures of some media such as acetate film, and see higher risk items have not yet reached advanced stages of decay. Software upgrades and hardware replacements are scheduled at longer intervals. Digitization has become essential for Indian manuscripts and archival records.

7. Conclusion

Preservation of rare documents, archival material, manuscripts etc., through digitization is need of the hour. It will help the archivists and librarians to preserve the documents and also to provide open access of complete contents to the scholars. Digital preservation and traditional preservation, conservation and restoration will go side by side. Digitization should be treated as supporting technique for the libraries and archives.

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