Digitization and Digital Preservation of Indian Cultural Heritage

Multimedia Digital Library Initiatives at IGNCA, New Delhi

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Topics covered

• About Indira Gandhi National Centre for the Arts (IGNCA)
• Kalanidhi-Indian Cultural Heritage Resource Centre at IGNCA
• Digitization Process
• Digitization of Indian Cultural Heritage at IGNCA and NMM
• Digital Archiving at IGNCA
• Digital Preservation
• Digital Preservation of Indian Cultural heritage at IGNCA and NMM
• Conclusions
IGNCA : AN INTRODUCTION

The Indira Gandhi National Centre for the Arts is visualised as a centre encompassing the study and experience of all the arts – each form with its own integrity, yet within a dimension of mutual interdependence, interrelated with nature, social structure and cosmology. The arts are here understood to comprise the fields of creative and critical literature, written and oral; the visual arts, ranging from architecture, sculpture, painting and graphics to general material culture, photography and film; the performing arts of music, dance and theatre in their broadest connotation; and else in fairs, festivals and lifestyle that has an artistic dimension.
Various divisions in IGNCA

- Kalanidhi
- Kala Kosha
- Janpada Sampada
- Kala Darshan
- Sutradhar
Kalanidhi

• The IGNCA is a National Information System and a Data Bank of the arts, humanities, cultural heritage with a fully supported reference library of multimedia collections. This information System and Data Bank will serve as a major resource centre for research in humanities, in the arts, in the disciplines of Archaeology, Anthropology, History, Philosophy, Literature, Language, Arts, Crafts etc.
Branches of Kala Nidhi

- Reference Library
- Cultural Archive
- Reprography Unit
- Slide Unit
- Media Production Unit
- Photography Unit
- Conservation Unit
The reference library of IGNCA has a large collection in the broad areas of humanities and the arts. It constitutes books, reprographics of several folios of unpublished Sanskrit, Pali, Persian and Arabic manuscripts in microfilm and microfiche, photographs and slides. The collection includes books on archaeology, philosophy, religion and ritual studies, history and anthropology, art and literatures as well as folk, pastoral and community studies. The library is enriched by many rare collections of illustrious scholars who have made path-breaking contributions in the fields of arts.
The library concentrates on encyclopaedias, dictionaries, bibliographies, atlases and catalogues of unpublished manuscripts of Indian and Asian origin. Its holdings and expertise are complemented by those of the other divisions of the Centre.

- Rare Books
- Personal Collection
- Area Collection
- Series & Catalogue
- Journals

Rare Books

Acquisition of rare books is a special feature of the Library. It has acquired books published in 18th and 19th centuries such as: The Travels of Sir John Charlin (1688); The Ceremonies and Religious Customs of various Nations of the known world together with historical annotations/Bernard Picard (1733-37); The works of Sir William Jones (1759-1801); Considerations of Indian Affairs/William Botts (1772); Journal of a route to Nagpore (1790); Narrative of the Campaign in India/Diorn (1793); Oriental Repository (1793-94); A Journey from Bengal to England through the northern part of India Kashmir, Afghanistan/George Forester (1797); Oriental Memories/James Forbes (1831); A Sketch of the History of the East India Company from its first formation to the passing/Robert Grant (1813); Letters Written in a Maharatta Camp/Thomas Duer Broughton (1815); Views in the Himalayan Mountains/James Baillie Fraser (1820); The History of Java/T. S. Raffles (1817); An Account of the fishes found in river Ganges/ Francis hamilton (1822); Historical Fragments of the Mogul Empire of the Mero-Hoes and of the English Concerns in Hindustan from the year/Robert Orme (1825); The History of British India/James Mills (1826);
Cultural Archives

- Material relating to different genres in the original and in the other forms of copies is collected, classified and catalogued in the Cultural Archives. The archives are enriched by personal collection, ethnographic collections documentation and cultural exchange. Many scholars, artists and art enthusiasts, over the last decades, have carefully and dedicatedly collected materials of their interest ranging from literature and personal histories, recitation, painting, music to folklore and tribal arts. Some of these rare collections of ethnography and audio/visual documentation of old masters and rare art forms have been acquired by the archives.
Cultural Archives

• Slides
• Books
• Artifacts
• Audio cassettes
• Video cassettes
• Spool Tapes (Music Records)
• Paintings
• Photographs
• Costumes & Jewellery
• Sculpture
Reprography Unit

• A unique feature of the Reprography unit of the Kalanidhi is the reprographic compilation of unpublished manuscripts in Indian and foreign collections from private and public libraries. A pioneering attempt has been made to bring under one roof primary sources of the Indian tradition lying scattered, fragmented, inaccessible or worse, in danger of extinction. At present the library contains more than ten millions folios of unpublished Sanskrit, Pali, Persian and Arabic manuscripts. Total 20,000 microfilm rolls (approx.) containing 2.5 lacs mss. have been generated so far.
### Summary of Total Collection

<table>
<thead>
<tr>
<th>Collection Area</th>
<th>Mss. Filmed</th>
<th>Folios Covered</th>
<th>Total Collection</th>
<th>Rolls Duplicated</th>
<th>Rolls Digitized</th>
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<td>12634237</td>
<td>20,152</td>
<td>11,599</td>
<td>12,275</td>
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</table>
Digital Visual Images

Visual Library

Total No. of Images available with IGNCA:
A photograph-and-slide collection is being developed. Slide collections of over one lakh art objects and illustrated miniatures in Indian and foreign collections have been compiled and documented. These include slide collections from the Victoria and Albert Museum, Chester Beatty Collection through courtesy of Indian National Trust for Art and Culture Heritage (INTACH), American Committee for South Asian Art (ACSAA), British Museum, and Oriental and India Office Collection, British Library.

Catalogue
- Slides with Kalanidhi - A
- Catalogue of Cultural Archive (Kalanidhi - C)
- Digital Images with Cultural Informatics Laboratory

Kalanidhi - A
Total No. of Slides available with Kalanidhi - A: 74547

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<tr>
<th>S.NO.</th>
<th>SLIDES</th>
<th>NO.S</th>
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<td>Mughal and Persian paintings and Illustrated Manuscripts</td>
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<tr>
<td>2</td>
<td>Gita Govinda</td>
<td>2090</td>
<td>Gita Govinda</td>
</tr>
</tbody>
</table>
Media Production Unit

- Audio cassettes-870 hrs
- Beta Cam- 1190 hrs
- DV Cam- 30 hrs
- Mini DV- 200 hrs
- VHS- 300 hrs

- Data Entered in Microsoft Excel
  - Audio – 510 Titles
  - Videos – 1304 Titles
ABIA Project at IGNCA

ABIA stands for Annual Bibliography of Indian Archaeology that was published by the Kern Institute in Leiden during 1926-1973. In 1996, the International Institute for Asian Studies (IIAS), Leiden put forward a proposal to resume the bibliography. The new bibliography is called ABIA South and Southeast Asian Art and Archaeology Index, briefly ABIA Index.

The IIAS, Leiden initiated this International project to compile and maintain a bibliographic electronic online database which supplies annotated records, covering the subjects- pre and proto history, historical archaeology, ancient and modern art history, material culture, epigraphy and palaeography, numismatics and sigillography. An Annotated Bibliography extracted from this database is published annually in a printed version.
The ABIA Project

The ABIA project is a global network of scholars co-operating on an annotated bibliographic database for publishers covering South and Southeast Asian art and archaeology. The project was launched in 1997 at the initiative of the International Institute for Asian Studies in Leiden, the Netherlands, in collaboration with international scholars and Asian academic institutes. The project receives scientific support from UNESCO.

The database ABIA South and Southeast Asian Art and Archaeology Index is fully searchable and is freely accessible. Extracts from the database are also available in the form of printed bibliographies.
The database ABIA South and Southeast Asian Art and Archaeology Index is fully searchable online and is freely accessible at http://www.abia.net

Two volumes have been published:
First volume in 1999
Second volume in 2002
Third volume expected in 2007

More details are available at http://www.abia.net

From Jan 2007 onwards IGNCA is the coordinating office for next 5 years
Users

The ABIA Index database is useful for
Art historians
Archaeologists
Asia specialists
Anthropologists
Numismatists
Historians
Epigraphists
It should also appeal to
Librarians
Curators
Educational service staff
Collectors of Asian art and coins
Participating Countries

Bangladesh
Bhutan
Cambodia
India
Indonesia
Malaysia
Nepal
Netherlands
Pakistan
Sri Lanka
Thailand
Online ABIA

### ABIA Index WWW search

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<tr>
<th>Link to website</th>
<th>Link to website</th>
<th>Link to website</th>
<th>Link to website</th>
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</thead>
<tbody>
<tr>
<td>WABA/NL Leiden</td>
<td>WAIM/UK Leiden</td>
<td>WAITH/TH Bangkok</td>
<td>WAIN/VIN New Delhi</td>
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</tbody>
</table>

**Show diacritic:** as Unicode/UTF-8 | **Sort** | **Per database** | **ALL records** | **Help with Search**

**Reset**

**Search**

**Author/editor (Last name)**

**AND**

**Author/editor (Last name)**

**OR**

**Title (words from)**

**AND**

**Title (words from)**

**OR**

**all fields**

**Filter:** publication year between A.D.

**and**

**Filter:** subject period between

**A.D.**

**B.C.**

**B.P.**

**SEARCH**
Background: Why a Mission for Manuscripts?

India is the repository of an astounding wealth of ancient knowledge belonging to different periods of history, going back to thousands of years. Most of this knowledge belonging to different areas of intellectual activity such as religion, philosophy, systems of science, arts and literature is preserved in the form of manuscripts. Composed in different Indian languages and scripts, they are preserved in materials such as birch bark, palm leaf, cloth, wood, stone and paper.

India has the largest collection of manuscripts in the world. They are spread all over the country and also abroad in different libraries, academic institutions, museums, temples and monasteries and in private collections. The rich manuscript wealth of India today faces a threat of survival. However, India has possibly lost a vast amount of this wealth. Sufficient information on them is not available today. Among the existing collection, most of them are in a state of decay and damage. Among the extant collection, only a very small portion has been surveyed and documented properly. Experts fear that almost all the palm leaf manuscripts will perish in the near future due to decay, and wear and tear. The invaluable heritage of India in the form of manuscripts has to be documented, preserved and made accessible to us and to succeeding generations.
Why to digitize?

- Faster Access
- To Improve services
- Archiving
- To protect the originality of the object/document etc-
Reduce the handling and use of fragile or heavily used original material and create a ”back up” copy for endangered material such as brittle books or documents
- Resource Sharing
- Preservation
Digitization Process...

- Purpose of Digitization
- Need for Digitization
- Materials to be Digitized
  - Selection
- Hardware requirements
- Software requirements
- Other technological requirements
- Conversion
  - Image quality and formats
  - Resolution
  - Compression
Digitization Process…2

- Quality Control
- Options for storage both short term and long term
- Collection Management
  - Organization of images
  - Naming of images
  - Description of Images
  - Use of metadata
  - Data Management
  - Document encoding
- Born Digital
- Legal Deposits
- Identification of Digital Archiving System
- Backup, Protection and Preservation
The Workflow for digitization process

1. Ready for digitization
2. Selection of material for digitization
3. Selection of manpower, technology and other infrastructural requirements

**Project implementation:**
Scanning / conversion in desired formats OCR, PDF, HTML, TIFF, JPEG, MPEG, DVD, PNG, MP3, WAV, ASCII, SGML, XML, Postscripts, and other international formats in desired resolution from 120 pixels to 6000 pixels as per requirements for use such as printing, internet and preservation

**Project implementation:**
Store it in available media such as CD/DVD, CD-DVD mirror servers, Zip or tap drives, Servers, Internet. The storage solutions also depends on the volume of the data

**Project implementation:**
Quality control, organization of the digitized materials, indexing, keywording, Meta data creation

Delivery mechanism, retrieval and access control, identification of a digital archival system

Protection, backup and preservation
UNESCO Guidelines

Guidelines for Digitization Projects: for collections and holdings in the public domain, particularly those held in libraries and archives

These Guidelines have been produced by a working group representing IFLA and the ICA that was commissioned by UNESCO to establish guidelines for digitization programmes for collections and holdings in the public domain. The contract specified that the guidelines should so far as possible be particularly applicable to institutions in countries of the developing world. Members of the group were nominated by IFLA and ICA and their activities were coordinated by Sjoerd Koopman, Coordinator of Professional Activities for IFLA.
Other Guidelines for Digitization

- IFLA
- UNC
- List of Other Guidelines
Digitization at IGNCA

• The digitization of materials, post digitization editing, high capacity storage & backup system, designing and development of effective retrieval system etc. Technology used for this development is based on Open standards using Unicode, a multilingual standards for fonts, accepted worldwide with open type fonts. Search is available both in English and Hindi (Devanagari). User have the option to select the material of his interest either from a specific type of collection like books, manuscripts, slides, audio, video etc or from the entire collections.
Digital Resources at IGNCA

- Bibliography
- A/V Collection
- IGNCA Publication
- Archival Collection
- Digital Images (Slides)
- CoIL-Net-Content development in Indian Language Network
- Databases
- CDROM
- Microfiches
- Microfilm
- Papers and Essays
- Rare Books
- Animations & Walk through Digital Images (Slides)
• These rare **manuscripts**, collected from different institutions of India and abroad are mainly in the form of microfilms and microfiche. Approximately 12000 rolls of microfilms (out of about 20000) have been digitized. The digitization of microfiche started recently. Similarly, **slides** ([View Digital Images](#)) are collected from the institutions like ACSAA, British Library, Victoria and Albert Museum etc. Slides over 100000 have been digitized. Rare Photographs digitized includes Rajah Deen Dayal collection, Sambhu Nath Saha collection etc. About thousand hours of Audio / Video **Film & Video Documentation** ([online audio / video](#)) is available in digital form out of total collection of over 10000 hours. A part of the **IGNCA's publications** ([electronic books available](#)) with the various volumes of **News Letters** (Vihangama) and **Kalakalpa: Bi-annual Journal** have been digitized.

• Digitization of Ganjuur and Danjuur manuscripts at the National Library of Mongolia

• Digitization of manuscripts at the National Museum, New Delhi

• Digitization of manuscripts at the Oriental Research Library, Srinagar
Digitization standards followed at the IGNCA for the digitization are as per the *UNESCO* Guidelines published in 2002.

- Slides: Photo CD format (five resolutions normally and six resolutions in specific cases).
- Microforms (Microfiche and Microfilms): 300 dpi tiff.
- Photographs: 300 dpi tiff (600 / 1200 dpi in special cases).
- Books and printed materials: 300 dpi tiff.
- Audio: 44 Khz .wav file format.
- Video: MPEG 1/2.
- Tiff. Uncompressed Lower quality derivatives are used for the online access of the materials.
Metadata

- Presently Catalogue records from LIBSYS are used
- Available Metadata of the contents will be finally converted in Extended Dublin Core, as practiced for majority of the digital library projects worldwide.
Digital Images

Indira Gandhi National Centre for the Arts

Collections

ACSAA (American Committee for South Asian Art)
Sculpture of Amrawati in Govt. Museum, Madras

| Set 1 | Set 2 | Set 3 | Set 4 |

- Sculpture of Goli
- Sculpture of Jagjaya Beta
- Sculpture of Ghantasala
- Sculpture of Nagarjuna Konda site
- Sculpture of India Bharhat
- Sculpture of India Pala
- Early Indian Stone Sculpture - LOS Angles CCU Museum of Art, California
- Early Bronze Sculpture - LOS Angles CCU Museum of Art, California
- Sultanate and Mughal Paintings - LOS Angles CCU Museum of Art, California
- Nepali and Tibetan Sculpture; the early phase - LOS Angles CCU Museum of Art, California
- Pala and Nepali Manuscript Painting - LOS Angles CCU Museum of Art, California
- South India Bronzes - LOS Angles CCU Museum of Art, California
- Southeast Asia Sculpture - LOS Angles CCU Museum of Art, California
Audio Recordings

Indian Classical Music (Hindustani)
"Raag Jogwanti" Download 37:28 minute audio in MP3 format - (2.13MB)
composed by Ustad Yunus Hussain Khan Sahib (Darpan) of Agra Gharana

Muktesvara Temple CD-Rom : Devotional Music

Vocal
- No. 1  03:26
- No. 2  02:55
- No. 3  02:30

Instrumental
- No. 1  07:51
- No. 2  04:32
- No. 3  10:50
- No. 4  05:40

Devnarayan (Forthcoming DVD-Rom)
- Eshmali and Chotu Bhut Urdu Ike Bazaar men (17:22)
- Devnarayan's Birth (Janam Path) (9/2/22)
Video Recordings

IGNCA
Indira Gandhi National Centre for the Arts

VIDEO RECORDINGS

To stop and restart the default audio use stop and refresh button of the browser

Restriction on the use of VIDEO

- **Gita Govinda** - 12th Century Sanskrit Poem on Radha and Krishna. Adapted in Painting, Music and Dance.
- **Bhradisvara Temple** - 11th Century Shiva Temple at Tanjore.
- **Kutiyattam** - Sanskrit Theatre from Kerala. Declared as among the Masterpieces of the Oral and Intangible Heritage of Humanity by UNESCO.

**Gita Govinda**

1. Lalit Lavanga
2. HariRiKuMugha
3. Dhire Samsara
4. Pashyati
5. Yahi Madhava
6. Kuru YadhunaNandana

Video about **Gita Govinda** 09:33
- Commentary (Text)
- About Gita Govinda - Text

**Lalit Lavanga**

Recitation of Poem Lalit Lavanga by Dr. Sampat Narayan

Applet bit scroll started
IGNCA DVD ROMs on Indian Cultural Heritage

DVD Roms Available for Sale

- Aihole - Cradle of Indian Architecture
- Sacred Dances at the Hemis Festival
- The Talking Rocks of Badami
- Temple Instruments of Kerala
- Behind the Mask
- Lai - Harappa
- Shrayana Belagola - The Jain Heritage Site
- Mahakumbha - In Search of the Nectar
- Echoes of the Past - Bijapur
- Dakshina Kannada - Land of the Mother Goddess
- Ram Lila - The Traditional Performance of Ramayana
- Sauk - Sur
- Legacy of Tana Bhagat
- Bhradisthara Temple Thanjavur - Mahakumbha Abhishekham
- Thang-Ta - Martial Art of Manipur
The present CD-ROMs on Ajanta is an attempt to provide comprehensive knowledge and visual experience on Ajanta, a major heritage site of India, included in the UNESCO's list of World Heritage monument. The CD-ROM includes virtual walkthrough of all the caves, narratives of Jataka and related stories of Buddha, approximately 1 hour of introductory video, approximately 1500 illustrated images. Articles from eminent authorities, Bibliography, Glossary, etc. Using the benefits of Digital Technology search facility has been incorporated to select the material available in CD irrespective of their format. From view point of technology, the site poses challenges, as the caves are endangered due to ravages of time.

The identification of Jatakas and scenes from the life of the Buddha and other devotional and ornamental depictions are based on the identifications by Dieter Schlingloff and Monika Zin.
IGNCA CD on Rock Art

ROCK ART

Image Collection

Publication Series

Man's first awareness of the world around came through his primeval sense of sight and ability to hear. These two senses have stimulated artistic expressions - visual and aural, in the pre-historic past as also contemporary cultures. The twin programmes of Adi Drāya (primeval sight) and Adi Sravā (primeval sound) have been initiated by the Centre to trace the long continuities in the Indian arts. Rock art forms the crucial programme of the Adi Drāya programme. It might in all probability be the oldest legacy of mankind.

Based on documentation, research and, to an extent, recreation of this ancient creative urge of man, this project will be a user friendly Computer Aided learning (CAL) application for children to access digital collection of slides, photographs and paintings with the help of quiz, slide show and modules on theme, dating, colour etc.

B.M. Pande was in the Archaeological Survey of India for more than 35 years, from where he retired as Director. He has been associated with several major archaeological excavations in India. He directed the excavations at Thaneser, district Kunukshetra, Harayana, while he was the Director of the Institute of Archaeology. He is associated with...
IGNCA CD on Temple of Muktesvara

THE TEMPLE OF MUKTESVARA AT CAUṆĀDEṆAPURA

Preface from the Book published by IGNCA

Selective Content of the CD-ROM

Cognitive map

A Glimpse of Karṇātaka

- Configuration
- History
- Religion

The Temple of Muktāvara

- Cauḍiapura
- History
- Architecture
- Decorative Motifs
- Iconography
- Epigraphy
IGNCA CD on Devadasi

DEVADASI MURAI "Remembering Devadasis"

- Image Collection
- This CD Offers
- Other Multimedia Projects

The term "Devadasi" refers to a female ritual specialist; good luck and well being are in her hands. Flickering lamps, cooling water, music and dance are her instruments. A formal ceremony solemnised her dedication to the God of the temple. In Tamil Nadu this millennia old tradition has seen great hey days.

This CD-ROM has been published in December 1997. This CD-ROM is part of IGNCA's endeavour to digitise the multidimensional performative rituals within the architectural space of Bhradshwara temple. The CD-ROM facilitates virtual experience of the spatial and temporal context of south Indian music and dance.

SASKIA KERSENBOMM. Ph.d. in Indology and Theatre Science (State University of Utrecht, Holland), is presently Associate Professor of Linguistics at Amsterdam, Holland. She has specialised in south Indian languages, literature and performing arts and has training in Indian classical dance, vocal and instrumental music. One of her major publications is Nityamangali, Devadasi Tradition in south India.
IGNCA’s Publications

CULTURE AND DEVELOPMENT SERIES

About Series

1. Interface of Cultural Identity Development (Culture and Development No. 1)
2. Integration of Endogenous Cultural Dimension into Development (Cultural and Development No. 2)
3. The Cultural Dimension of Education (Cultural and Development No. 3)
4. The Cultural Dimension of Ecology (Cultural and Development No. 4)
5. Lifestyle and Ecology (Cultural and Development No. 5)
6. Culture of Peace (Cultural and Development No. 6)

PRAKRTI SERIES

About Series - THE INTEGRAL VISION

1. Primal Elements : The Oral Tradition Vol. 1
2. Vedic, Buddhist and Jain Traditions Vol. 2
3. The Azamic Tradition and the Arts Vol 3
4. The Nature of Matter Vol. 4
5. Man in Nature Vol. 5

KALASAMALOCANA SERIES

About Series
Kalakalpa

The bi-annual journal of the IGNCA with a holistic approach towards the study of Arts and stress on the inter-connectivity of various art forms

Journal of the Indira Gandhi National Centre for the Arts

Fondled by the imaginative vision and creativity of the sage-like scholars, let this with-fulfilling tree in the field of arts, be an eternal source of joy to its readers

Editorial Advisory Board:

- Dr. L.M. Singhvi
- Prof. V.N. Mishra
- Shri M.V. Kamath
- Smt. Sonal Man Singh

Editors:

- Prof. I.N. Chaudhuri
- Prof. G.C. Tripathi
- Prof. R.K. Bhattarcharya

Contents:

- **Volume I, No. 1, July 2003** (Inaugural Issue)
Vihangama - IGNCA’s Newsletter

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Vol. V & VI 2004

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Vol. III & IV 2004

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Vol. II (March - April 2004)
# Conference Proceedings

## INTERNATIONAL CONFERENCE ON MULTIMEDIA FOR HUMANITIES

**October 5 - 8, 1998**

In order to generate a dialogue, we have invited experts from within the country and elsewhere who have accomplished significant achievements in their respective fields to explore the above themes and questions through the following sessions:

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<tr>
<th>Abstracts - MULTIMEDIA &amp; LIVING TRADITIONS</th>
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<td>Multimedia presentation: Mask Project</td>
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<td>Multimedia and Living Traditions: Devnarayan</td>
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<tr>
<td>Lowcost Multimedia Technology and Education - An Indian Perspective</td>
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<tr>
<td>Multimedia in Education - Rock Art</td>
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<td>Scran: a case study of Networked Cultural Multimedia for Education</td>
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<td>The future of Multimedia in Arts and Humanities</td>
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<tr>
<td>Towards a Digital Museum - Experiments at National Museum of Ethnology, Osaka, Japan</td>
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</tbody>
</table>
Recognizing the need to encompass and preserve the distributed fragments of Indian art and culture, and to serve as a major resource centre for the arts, the Indira Gandhi National Centre for the Arts (IGNCA) in collaboration with Ministry of Communication and Information Technology, initiated a project, KALASAMPDA (Digital Library: Resources of Indian Cultural Heritage) , for the development of databank of cultural heritage. Kalasampada facilitating the scholars (users) to access and view the materials including over couple of lakhs of manuscripts, over a lakhs of slides, thousands of rare books, rare photographs, audio and video along with highly researched publications of the IGNCA, from a single window. Multimedia computer technology has been used for the development of a software package that integrates variety of cultural information accessible at one place. This will provide a new dimension in the study of the Indian Art and Culture, in an integrated way, while giving due importance to each medium. The system aims at being a digital repository of content and information with a user-friendly interface.
Installation of D-Space

• D-Space – Open source digital library software has been installed at Kalanidhi Reference Library. It is proposed to upload the entire digital collection of Kalanidhi in D-space.
Dspace at IGNCA...1

This is a default installation of DSpace!

It can be extensively configured by installing modified JSPs, and altering the site configuration.

DSpace is Live

Welcome to our digital repository of My University research!

More exciting news to appear here.

Search

Enter some text in the box below to search DSpace.

Communities in DSpace

Choose a community to browse its collections.

A. Kalanidhi [14]
B. Janapada Sampada [0]
Dspace at IGNCA...2

Communities and Collections

Shown below is a list of communities and the collections and sub-communities within them. Click on a name to view that community or collection home page.

- **A. Kalanidhi**
  - Audio [2]
  - Newsletters [3]
  - Photographs [4]
  - Rare Books [2]
  - Video [1]
  - **Slide Unit**
    - Slides [1]
    - **Manuscripts Unit**
      - MSS [1]

- **B. Janapada Sampada**
  - Masks [0]
### DSpace at IGNCA...3

#### Browse by Title

<table>
<thead>
<tr>
<th>Date of Issue</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-Feb-2002</td>
<td>Building Preservation Partnerships</td>
<td>Lefurgy, William</td>
</tr>
<tr>
<td>22-Mar-2005</td>
<td>Gita Govind</td>
<td>Jaidev</td>
</tr>
<tr>
<td>17-Mar-2006</td>
<td>Image-0002</td>
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<tr>
<td>17-Mar-2005</td>
<td>Main Gate of Raja Din Dayal Palace</td>
<td>Sharma, Sriman</td>
</tr>
<tr>
<td>22-Mar-2005</td>
<td>Morning Walk</td>
<td>Ranganathan, S.R.</td>
</tr>
<tr>
<td>17-Mar-2006</td>
<td>One beautiful Song</td>
<td></td>
</tr>
<tr>
<td>17-Mar-2005</td>
<td>Palace of Raja Din Dayal</td>
<td></td>
</tr>
<tr>
<td>17-Mar-2005</td>
<td>Radha</td>
<td></td>
</tr>
<tr>
<td>17-Mar-2005</td>
<td>Raja Din Dayal</td>
<td></td>
</tr>
</tbody>
</table>
Linking of Electronic Resources through LIBSYS OPAC

- It is also proposed to link the digital images of all Kalanidhi Division collections to their respective catalogue entry. This is under testing.
CoLL-Net – Content development in Indian Language Network

- a project sponsored by Ministry of Communication and Information Technology (MCIT). Main objectives of the project are:
  - To enhance the access to cultural resources using digital technology
  - To develop a reusable ‘MODEL DESIGN’ and ‘Development Process’ for implementing user friendly web enabled heritage library for Hindi speaking population and other Hindi knowing persons in India and Abroad.
  - To implement a web enabled Hindi Based multimedia heritage library also offering contextual and vetted links to important websites to contribute towards the socio-economic development of Hindi Speaking region.
Some thoughts

• Preservation vs Digital Preservation
• Digital Preservation in India
• Why IASC ……
• Let’s understand What is? what has been done? what has to be done? How it has to be done?
Principles of Preservation as Applied to Digital Preservation

• The basic principles of preservation that are being practiced for preservation of analogue media are also applicable to preservation in the digital world:
  • Longitivty
  • Selection
  • Quality
  • Integrity
  • Access
What is not “Digital Preservation”? 

- Digitization
- Copying
- Born digital collections
- Websites
- Online Resources provided by commercial publishers
- Digital Library Services
- Library Automation
- E-commerce
May be or may not
“Digital Preservation”

- Institutional Repositories
- Learning Management Systems
- E-learning
- E-Publishing
- Mirroring
- Backup
- Digital Archeology
- Microform i.e. Microfilm, Microfiche, Audio Video etc.
Digital Cycle

- Production/Digitization
- Storage
- Digital Archiving/Digital Libraries
- Organization
- Search & Retrieval
- Digital Preservation
What is digital preservation?

• Generally speaking the digital preservation is about safeguarding and maintaining a digital collection for long term i.e. into the foreseeable and distant future
• The sustainability and accessibility of the digital collection is the main objective of scheme of digital preservation
• The preservation of digital collection is must as without appropriate digital preservation method a digital collection may become useless
• The main goal of a digital preservation process is to keep digital information in readable and usable condition
• It combines policies, strategies, and actions that ensure access to digital content over time.
Digital preservation – why?

• Preservation links the past with the future
• Knowledge is one of the few things that lasts...
• Significant part of world’s knowledge & heritage is in digital form
• Needs to be preserved as Memory of the World on Preservation of Digital heritage)
UNESCO


Article 1:

“The digital heritage consists of unique resources of human knowledge and expression.”

“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.”
UNESCO Charter: Articles

- Article 2 – Access to the digital heritage
- Article 3 – The threat of loss
- Article 4 – Need for action
- Article 5 – Digital continuity
- Article 6 – Developing strategies and policies
- Article 7 – Selecting what should be kept
- Article 8 – Protecting the digital heritage
- Article 9 – Preserving cultural heritage
- Article 10 – Roles and responsibilities
- Article 11 – Partnerships and cooperation
Who are the stakeholders?

- Traditionally librarians, archivists, records managers, Conservators newer stakeholders...
- Hardware & software developers, creators, publishers, producers, distributors, managers of digital repositories, rights holders...
Information Density V/s Life Expectancy of Storage Media

The Dilemma of Modern Media

Information Density v. Life Expectancy

- Clay Tablet
- Illuminated
- Gutenberg
- Moby Dick
- Newspaper
- Microfilm
- Microfiche
- Disk
- Optical

---

- Years of Use
- Characters per Square Inch
Problems accessing digital information on different layers

Human being can read information

Hard- and Software, to render and interact with digital information

Hard- and Software to interpret digital information

Hard- and Software to read digital information

Bit-stream
Threats…

- Media failure
- Hardware Failure
- Software Failure
- Communication Errors
- Failure of Network Services
- Media and Hardware Obsolescence
- Software Obsolescence
Threats...2

- Natural disasters
- External Attack
- Internal Attack
- Economic Failure
Why do we need Digital Preservation...1?

- Digital Objects require specific environment to be accessible:
  - Files need specific programs
  - Programs need specific operating systems (-versions)
  - Operating systems need specific hardware components
- SW/HW environment is not stable:
  - Files cannot be opened anymore
  - Embedded objects are no longer accessible/linked
  - Programs won't run
  - Information in digital form is lost (usually total loss, no degradation)

Digital Preservation aims at maintaining digital objects authentically usable and accessible for long time periods.
Why do we need Digital Preservation…2?

E-resources can and do disappear.

- **Removal:** 27 months after publication up to 13% of online cited sources are irretrievable*
- **Obsolescence:** Tapes of U.S. census data from 1960’s are now inaccessible
- **Loss:** Location of NASA’s original moon landing recordings is (currently) unknown
- **Funding:** Funding for the long standing UK Arts and Humanities Data Service discontinued April 2008
- **Orphans:** When ownership or other rights become uncertain, availability is threatened

Why do we need Digital Preservation...?

- The shift to reliance upon e-resources is accelerating.
- E-resources consume a growing portion of total library materials expenditures.
- Libraries typically license access to rather than own outright e-resources.
Backup vs. Digital Archiving vs. Digital Preservation

- Purpose
- Risk Management
- Storage Architecture
- Access
- Security
- Indexing
- Retention
Digital Preservation Approaches...

- Digital Preservation-Contents
  - Refreshing
  - Migration
  - Emulation
  - Creation of interoperable archive
  - Persistent Digital Identifiers
  - Replication
  - Mirroring
  - Preservation Metadata
Digital Preservation Approaches...2

- Normalisation
- Digital Archaeology
- Hardware Museum/Technology Preservation
- Print to Paper or Microfilm/fiche or barcode
- Digital Preservation- Media
  - Care and handling
  - Storage
  - Preventive
Refreshing

- copying digital information from one long-term storage medium to another with no change in the bit-stream

- Addresses both decay and obsolescence issues related to the storage media.

- Does not address the issue of obsolescence of encoding and formatting schemes.

- Longevity of media does not guarantee availability of hardware / software required to read the stored format.

- Backward compatibility and interoperability are serious threat to longevity of digital information.
Migration

- Periodic transfer of digital materials from one hardware / software configuration to another, or from one generation of computer technology to a subsequent generations.

- Migration may include conversion of data to avoid obsolescence not only of the physical storage medium, but of the encoding and format of the data.

- Digital objects will have to be constantly migrated and converted to new formats, computing devices, storage media and software to ensure they are not left behind on obsolete system.
Emulation

• Emulation uses a special type of software, called an emulator, to translate instructions from original software to execute on new platforms.

• Eliminate the need to keep old hardware working.

• Emulation requires the creation of emulator programs that translate code and instructions from one computing environment so it can be properly executed in another.
Technology Preservation

• Also called the “computer museum” solution.
• Rely on preserving the computer, operating systems, original application software, media drives, etc.
• Applicable for neglected digital objects.
• Assumes that media has not decayed beyond readability.
• Limitation: No obsolete technology can be kept functional indefinitely.
• Requires a considerable investment in equipment and personnel.
Replication

- Replication is used to represent multiple digital preservation strategies.
- Bit-stream copying is a form of replication.
- LOCKSS (Lots of Copies Keeps Stuff Safe) is a consortial form of replication, while peer-to-peer data trading is an open, free-market form of replication.
- Objective is to enhance the longevity of digital documents while maintaining their authenticity and integrity through copying and the use of multiple storage locations.
Digital Archaeology

• Rescue content from damaged media or from damaged hardware and software
• An emergency recovery strategy involves specialized techniques to recover data from unreadable media, either due to physical damage or hardware failure.
• Carried out by data recovery companies
• Given enough resources, readable bit-streams can often be recovered even from heavily damaged media (especially magnetic media)
Encapsulation

- Technique of grouping together digital objects and metadata necessary to provide access to that object.
- The grouping process lessens the possibility that any critical component necessary to decode and render a digital object will be lost.
- Appropriate types of metadata to encapsulate with a digital object include reference, representation, provenance, fixity and context information. Encapsulation is considered a key element of emulation.
Analogue Backups

- Combines the conversion of digital objects into analogue form, e.g., taking high-quality printouts or the creation of microfilm.
- An analogue copy of a digital object can, in some respects, preserve its content and protect it from obsolescence.
- Technique makes sense for documents whose contents merit the highest level of redundancy and protection from loss.
Reliance on Standards

- Advocates use of well-recognized standards and discarding proprietary or less-supported standards.
- Backward compatibility for older formats would be maintained if it is widely used as a standard.
- For example, if JPEG2000 becomes a widely adopted standard, the sheer volume of users will guarantee that software to encode, decode, and render JPEG2000 images will be upgraded to meet the demands of new operating systems, CPUs, etc.
Digital Preservation Metadata

- A subset of metadata that describes attributes of digital resources essential for its long-term accessibility.

- Describe and record information needed to manage the preservation of digital resources.

- A subset of administrative metadata design to assist in the management of technical metadata for continuing access to the digital content.

- Stores technical details on the format, structure and use of the digital content.
Administrative or technical Metadata...

- It is needed to manage a digital object throughout its lifecycle and is required for long-term collection management.
  
  Original source
  - Date of capture / creation
  - Scanning resolution
  - Initial Capture Settings
  - Version of digital object
  - File format(s)
  - Compression technology used
  - Object relationship, etc.
Administrative or technical Metadata

- Most of the administrative / technical metadata can be generated automatically by the hardware and software used for capturing contents.
- The administrative metadata also records legal and financial aspects of access to the object such as: Rights management; Costs; authorization; Authentication; etc.
Preservation Standards

• Open Archival Information System Reference Model (OAIS RM)
• PREMIS (Preservation Metadata: Implementation Strategies)- a joint collaborative project of OCLC and Research Library Group
• XML and Schema
• Persistent Identifiers
PREMIS (Preservation Metadata: Implementation Strategies) - a joint collaborative project of OCLC and Research Library Group

- To define a implementable set of core preservation metadata elements with broad applicability with digital preservation community
- Draft a data dictionary to support the core preservation metadata element set.
- Examine and evaluate alternative strategies for encoding, storage and management of preservation metadata within a digital preservation system, as well as exchange of preservation metadata among systems.
- Conduct the pilot program to testing the group’s recommendations and best practices in a variety of system settings
- Explore the opportunities for cooperative creation and sharing of preservation metadata.
OAIS Model – Example for a Standard

Submission Information Package
Archival Information Package
Dissemination Information Package
Digital Preservation Policy and Strategy

- Resources - Manpower, Technology, Funding, Collaborative Partnerships
- Collections
  - Document types and formats
  - Digitization Strategies
- Requirements
  - Collection Development
  - Digital Archiving
  - Web Archiving
  - Content Management Systems / Data Asset management Systems
- Standards
- Copyright and other legal issues
- Training and work flow
- Preservation Metadata
- Preservation and metadata
Digital Preservation-Media

- Storage – Short and Long Term
- Preservation- both media and contents
- Storage- Media
  - Portable Media- CD/DVD, DAT and DLT Tapes, Zip and Jaz Drives etc
  - Non-portable Media- PC Hard Drives, Network Servers etc.
- Labeling, Organization
- Care and Handling
- Storage- Climatic conditions
Storage- care and handling

- Media should be stored in the correct cases and or cabinets designed as per its storage requirements. It should not be left inside the machine.
- Media should be stored as per guidelines provided under various national and international standards for storage and exhibition of archival documents.
- Following preventive measures should be taken to ensure the safety of the media:
  - Drives should be regularly cleaned.
  - Media should be kept away from agents of fire and sources of magnetic fields etc.
  - Media should be regularly checked on periodic basis.
  - The data storage surface of the media should not be touched.
  - Labels should be fixed in the designated area on the media.
- The media-specific guidelines should be followed in accordance with various national and international standards.
## Storage - Climatic conditions

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Media</th>
<th>Short Term Preservation</th>
<th>Long Term Preservation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Temperature</td>
<td>RH</td>
</tr>
<tr>
<td>1</td>
<td>Flexible magnetic disks, CD, DVDs, Magnetic tapes, Solid state media etc</td>
<td>10-51°C</td>
<td>10-80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18-22°C</td>
<td>35-45%</td>
</tr>
<tr>
<td>2</td>
<td>Optical disks, Mixed collections, DAT, DLT tapes</td>
<td>16-32°C</td>
<td>20-80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16-32°C</td>
<td>35-60%</td>
</tr>
</tbody>
</table>
The Library of Congress has **formed a growing network of preservation partners** both in the United States and abroad to help save digital information that would otherwise be lost.

## Architecture Development

The Library of Congress and its partners are building the technical tools and services that make long-term access possible.

### Research

- Drexel University, Geometric and Intelligent Computing Laboratory ([Digital Engineering Archives](https://digitalengineeringarchives.org))
- Johns Hopkins University, Hopkins Storage Systems Lab ([Securely Managing the Lifetime of Versions in Digital Archives](https://www.hopkinsarchive.org/))
PADI is a subject gateway to international digital preservation resources

Browse the Resource Types list or brief Topics list below OR the full topic list OR use Search OR PADI Trails

RESOURCE TYPES

- Events
- Policies, Strategies & Guidelines
- Projects
- Organisations & Websites
- Bibliographies
- Discussion Lists
- Glossaries
- Journals & Newsletters
- News & Discussion
- padiforum-l
- DPC/PADI Digest ‘What’s New’

DIGITAL PRESERVATION TOPICS

- Data Documentation & Standards
- Digital Libraries
- Digital Records
- Digitisation
- Formats & Media
- General Resources
- Issues
- Management
- National Approaches
- Rights Management
- Strategies
- Web Archiving

Current Issue

More topics...
The Digital Preservation Coalition (DPC) is a not-for profit membership organisation whose primary objective is to raise awareness of the importance of the preservation of digital material and the attendant strategic, cultural and technological issues. It acts as an enabling and agenda-setting body within the digital preservation world and works to meet this objective through a number of high level goals. Its vision is to make our digital memory accessible tomorrow.

Digital Preservation Coalition New Executive Director

The Digital Preservation Coalition (DPC) is pleased to announce that Dr William Kilbride has been appointed to the post of DPC Executive Director.

William has many years of experience in the digital preservation community. He is currently Research Manager for Glasgow Museums, where he has been involved in digital preservation and access aspects of Glasgow's museum collections, and in supporting the curation of digital images, sound recordings and digital art within the city's museums.

Previously he was Assistant Director of the Archaeology Data Service where he was involved in many digital preservation activities. He has contributed to workshops, guides and advice papers relating to digital preservation.
Digital Information Archiving System

DIAS

Introduction
Today, most information exists in digital form and in some cases it only exists in digital form. Often, long-term archiving is still done in a non-digital way; storing tangible artefacts (e.g. paper documents, audio tapes, etc.). Archiving of digital information has many advantages, like being able to make the information available to large groups of people, without compromising the safety of the original artefacts (e.g. cultural heritage), or much easier re-use of the archived information to create new or adjusted (digital) information. Commercial interests can become very large, e.g. when a building or an airplane needs to be modified and the digital “blue print” can’t be viewed any more, because the technology with which it was made, has become obsolete. In such cases it might cost a person-year or more to recreate the original drawings. Sometimes, long-term digital preservation is a necessity; e.g. for compliance reasons.

When digital information is archived for a longer period of time (e.g. >20 years), several problems will eventually arise:

- The medium (e.g. magnetic/optical disk, tape) on which the data is stored will become obsolete, so that it can’t be read any more by any device;
- The medium on which the data is stored will deteriorate, causing loss of data;
- The format in which the data is stored will become obsolete, so that it can’t be displayed any more by any current software;
- The old software that can display the data doesn’t run any more on any of the current hardware & operating system platforms.

So, apart from keeping the digital information available, it must also be kept accessible. For a 6 minute online presentation explaining the challenges in this area, see the [kopal demonstrator](#). This demonstrator has been created in a German project (see below).
Welcome to Planets

Planets, Preservation and Long-term Access through Networked Services, is a four-year project co-funded by the European Union under the Sixth Framework Programme to address core digital preservation challenges. The primary goal for Planets is to build practical services and tools to help ensure long-term access to our digital cultural and scientific assets. Planets started on 1st June 2006. This website makes available project documentation and deliverables as Planets progresses so that these can be shared with the libraries, archives and digital preservation community.

The strong Planets consortium brings together expertise across Europe from national libraries and archives, leading research universities and technology companies. Coordinated by the British Library, the partners are:

- The British Library
- The National Library of the Netherlands
- Austrian National Library
- The Royal Library of Denmark
- State and University Library, Denmark
- The National Archives of the Netherlands
- The National Archives of England, Wales and the United Kingdom
- Swiss Federal Archives
NESTOR- Network of Expertise in Long-Term Storage of Digital Resources

- [http://nestor.sub.uni-goettingen.de](http://nestor.sub.uni-goettingen.de)
- to create a network of expertise in long-term storage of digital resources for Germany.
- the emphasis is put on long-term accessibility.
- Within the project the following offers will be created:
  - a web-based information forum,
  - a platform for information and communication,
  - criteria for trusted digital repositories,
  - recommendations for certification procedures of digital repositories,
  - recommendations for collecting guidelines and selection criteria of digital resources to be archived,
  - guidelines and policies, the concept for a permanent organisation form of the “network of expertise in digital preservation”.
- The long-term goal is a permanent distributed infrastructure for long-term preservation and long-term accessibility of digital resources in Germany comparable for example to the Digital Preservation Coalition in the UK.
Information Platform

Search
the whole Information Platform

Additional Information

Information Platform

The nestor-Information Platform consist of different components: The Subject Gateway points to German-language resources in digital preservation. Persons who are engaged in digital preservation can create a personal profile to show their activities in the Who Where What area. In What's new you can find news, current events and new entries to the Subject Gateway. The Calendar lists national and international events in the topic of digital preservation. Relevant German-language projects in the field of digital preservation are listed in the Projects area. The Newsletter reports regularly about developments in the nestor- and related projects. You can find elaborated rotations for some records from the Subject Gateway in the Annotation area.
One of the open problems of the global information society is to ensure the long-term accessibility of digital documents. *kopal* tackles this problem head-on:

- This cooperative project, supported financially by the Federal Ministry of Education and Research, is developing an innovative technical solution in the form of a reusable long-term archive for digital data.
- It is based on DIAS (Digital Information and Archiving System), jointly devised by IBM and the National Library of The Netherlands in The Hague.
- The system will be implemented in accordance with international standards for long-term archiving and metadata within the OAIS framework (Open Archival Information System).
About kopal

kopal - Co-operative Development of a Long-Term Digital Information Archive

Making digital documents available long-term is one of the still unsolved problems of our information society. With the increasing number of electronic publications, it is becoming critical that we reliably archive them. In the course of technological development, new digital file formats which are dependent on specific hardware and operating systems are continually being developed and used. Thus, older data are often not usable with current hardware and software. The kopal project is dedicated to finding a solution to this problem in the form of a cooperatively developed and operated long-term archive for digital data.

The kopal demonstrator (in German) visualizes concept and workflow of the kopal archival system.

Die Deutsche Bibliothek, the Niedersachsische Staats- and Universitaetsbibliothek Goettingen (Goettingen State and University Library), the Gesellschaft fuer
reuse: A European Community Project of the e-content Programme at DDB

- http://reuse.uibk.ac.at/
- The project is being coordinated by University Innsbruck Library, Austria. DDB is the project partner along with 8 more European Libraries.
- This project proposes to archive the master copy of a book developed at the time of the printing as most of the books printed now a days are from the born digital copies only.
[2006-04-10] The “National Report”, that was published at the beginning of April 2006, presents the findings of an analysis for exploiting the ideas of reUSE on a national basis (Slovenia). [more]

[2006-03-30] Since end of March 2006 the reUSE team has published the “Evaluation Report”. It covers the results of the project and presents a transparent and objective collection of data. But most importantly, a new methodology for the evaluation of digital repositories has been developed, which could be used for the assessment of other repositories. The findings in the Evaluation Report are useful to the library community. [more]

[2006-03-01] The first European-Wide “SURVEY ON THE LONG-TERM PRESERVATION OF DIGITAL DOCUMENTS IN EUROPEAN LIBRARIES” realised with the reUSE project by Krimbacher, Neuhauer & Vogl, has been carried out successfully. 330 libraries in 25 European countries returned a valid questionnaire and therefore we do have the first ever representative answers on the status quo of digital preservation among all national, general research and academic libraries in the European Community. [more]

[2006-09-15] As per end of the first project year, the reUSE team published the annual report. It can be stated that the reUSE team is in a good progress and still in a high position compared to its foresee aims. [more]

[2005-09-01] In the first week of September around 700 libraries in Europe will be contacted in order to take part in a “Study on trusted digital repositories in Europe”. The aim of the study is to evaluate the current situation of digital preservation in Europe’s libraries. It is carried out by the Austrian company Krimbacher, Neuhauer & Vogl. [more]

[2005-07-01] DIGAR is a digital repository of National Library of Estonia. It has been set up within the reUSE project and is online since July 2006. DIGAR is collecting, preserving and making available the digital copies of books and publications obtained from the public sector institutions in Estonia. In June 2006, after
National Digital Preservation Programme

Department of Information Technology, Government of India is in the process of formulating the national initiative on National Digital Preservation Programme (NDPP). It is intended to address the technological challenges involved in the long term digital preservation of historically significant cultural materials, heritage archives, citizen information, libraries, scientific data, and other important information resources, etc.

India with its massive plans for e-governance and use of ICTs in education, health and other sectors of the economy, needs to address the issue of digital preservation as early as possible. It is with this objective in mind that the National Digital Preservation Programme is being formulated.
Background

Department of Information Technology, Government of India is in the process of formulating the national initiative on National Digital Preservation Programme (NDPP). It is intended to address the technological challenges involved in the long term digital preservation of historically significant cultural materials, heritage archives, citizen information, libraries, scientific data, and other important information resources, etc. India with its massive plans for e-governance and use of ICTs in education, health and other sectors of the economy, needs to address the issue of digital preservation as early as possible. It is with this objective in mind that the National Digital Preservation Programme is being formulated.
Legal Aspects

• Copyright and other intellectual property rights (IPR) have a substantial impact on digital preservation
• Preservation of digital materials is dependent on a range of strategies, which has implications for IPR in those materials
• Consideration may need to be given not only to content but to any associated software
• Specific permissions may be very challenging e.g. for webarchiving or digital art
Conclusions…3

• Unlike Library automation and digital libraries, the Digital preservation is not required for each and every library
• Lets identify our strengths and weaknesses
• Lets understand the concept and our needs, roles, goals, priorities, for digital preservation
• Man management and change management is the key to success
• We are not very far, it is the right time to catch the
• Forging Collaborative Partnerships is the key
• Believe in yourself, we can do it
Conclusions

- About 40% non-print material such as manuscripts in microfilm and microfiche formats, slides, photographs, rare books, and paintings, etc. have already been digitized.
- We are in the process of digitization of entire non-print material. About 2 lacs cultural archival material, 1700 rare books, 2.5 lacs manuscript in microfilming format, 1 lac visuals more than 1000 hours of Audio Video recordings, 9 personal collections of eminent scholars and artists, photographic collection of eminent photographers such as Lala Deen Dayal, 1000 Paintings are some of the unique collections at Kalanidhi Division.
• A digital library of manuscripts is another important plan of Kalanidhi Division of IGNCA.

• Online catalogue of about 8 lacs cultural resources in MARC 21 format, Installation of CD mirror server, networking of various Divisions of IGNCA and finalization of various metadata formats for collection such as photographs, manuscripts, slides and audio-video material are some of the plans under implementation.

• Moreover, masks collected from various parts of the India, textiles and other tangible and intangible heritage material have thrown new challenges for digital library experts to preserve them in digital images