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Indo-US Workshop on International Trends in Digital Preservation

Ecosystem for Digital Preservation in Indian Context: A Proposal for Sustainable and Iterative Lifecycle Model



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Multimedia Rendering of Dnyaneshwari & Bhagvadgita

Project executed during 1997-2000

Objective of the Project:

- Use multimedia technology for authentic, interactive, learnable and experiential rendering of Dnyaneshwari and Bhagvadgita
- Preserve and propagate our cultural heritage

Content Details:

- 6000 pages of Marathi and Sanskrit Text
- 240 hours of audio recording of recitation (Un-edited data of 12 GB)
- 12000 Audio Files
- 24 Interactive Maps
- 50 Animations
- Total Size of Final Application 1 GB
- Developed using Macromedia Authorware Professional
- Developed to run on Windows 95/98/NT/2000

Digital Preservation Case Study –01

Multimedia Rendering of Dnyaneshwari & Bhagvadgita

Elements of Digital Preservation and Specs.	Today's Status
1. Image Rendering – High Resolution 16 BIT, RGB True Color, PSD and JPG File format	<ul style="list-style-type: none">• Content is intact and source files are usable• Photoshop continues to support the files created using its older versions
2. 2D Animation – 6 Frames per second, 8 Bit, 256 Colour Palette Animator Professional Software FLC file format Dimensions 320 x 400 pixels	<ul style="list-style-type: none">• Animator Pro is discontinued by AutoDesk• Source files can not be opened / used• FPS, Resolution and color specifications are very inferior quality if compared with today's standards
3. Text Entry – Special font with extra Devnagari characters was designed for Sanskrit Shlokas Leap Office software, True Type Font	<ul style="list-style-type: none">• Current Leap Office version supports the files created using its older versions• Difficult to convert into another font / Unicode font
4. Audio Recording – Source data 16 Bit, 44 kHz, Multi channel, WAV format Actual use in application 16 Bit, 22 kHz	<ul style="list-style-type: none">• Content is intact and source files are usable• Final application uses inferior quality of audio to reduce the size of application

Digital Preservation Case Study -01

Multimedia Rendering of Dnyaneshwari & Bhagvadgita

Elements of Digital Preservation and Specs.	Today's Status
5. Display Resolution Initially 640 x 480 pixels Later-on scaled to suite 800 x 600 pixels	<ul style="list-style-type: none">• As per today's displays e. g. 1440 x 990, the application appears to be very small in size• The content has become less readable
6. Screen Layout – Fixed layout	<ul style="list-style-type: none">• Present layouts, the amount of text and its sizes are hard-coded to suit older display settings• Layouts specifications don't change with the higher display resolution
7. Development Tool – Macromedia Authorware Prof. version 4	<ul style="list-style-type: none">• Macromedia bought by Adobe in 2005• Authorware supported only till version 7
8. Source Code- Closed source code	<ul style="list-style-type: none">• Source code is closed, there are no migration possibilities
9. Maintenance of Source Code – Not possible	<ul style="list-style-type: none">• Authorware followed the policy of supporting the files of just the earlier version• To use the files of Authorware 4, we will have to convert them through the versions of 5, 6 and then 7
10. Database – All content is integrated in Authorware database	<ul style="list-style-type: none">• Content can not be reused as it is integrated in the database, one can access it only through Authorware

Digital Preservation Case Study -01

Multimedia Rendering of Dnyaneshwari & Bhagvadgita

Elements of Digital Preservation and Specs.	Today's Status
11. Metadata – Searchable keywords	<ul style="list-style-type: none">• Metadata is part of the closed source code of Authorware
12. Database – All content is integrated in the Authorware database	<ul style="list-style-type: none">• Content can not be reused as it is integrated in the database. One can access it only through Authorware software, which is not supported anymore.
13. Operating System No support anymore	<ul style="list-style-type: none">• Adobe has no plans to support Authorware for Windows Vista
14. Delivery of Application – Executable	<ul style="list-style-type: none">• Runtime application is still usable in Windows Vista• Installation program needs modification
15. Storage / Backup DAT Tapes CDs 3.5" Floppies	<ul style="list-style-type: none">• DAT Tapes and CDs are usable• 3.5" Floppies were used to store the text files but later on this data was backed up on CDs
Conclusion Multimedia rendering of Dnyaneshwari and Bhagvadgita has almost reached the dead-end in 2008. It is difficult to revive or migrate the interactive content into another tool. Only the source files of audio recording remain useful.	

Multimedia Rendering of Dnyaneshwari & Bhagvadgita

Lessons for Long Term Digital Preservation

- **Render the images with higher resolution and in true color**
- **Use scalable vector graphics for animation**
- **Store the source images of animation and not just the final animated output**
- **Store all digital content in uncompressed format**
- **UNICODE based text entry using default system font**
- **Avoid integrating the content as part of database**
- **Avoid proprietary software tools and file formats**
- **Use open source tools**
- **Use scalable / dynamic/ liquid layouts for presentation of contents so as to adopt with changing display resolutions**



■ **JATAN : Virtual Museum Builder**



- **Conservation Report Tool**
- **PDA Access to Virtual Museum**

Jatan

VIRTUAL MUSEUM TECHNOLOGIES



■ **Integrated Framework**



■ **Compliance Enforcement Tool**



Archaeology (JATAN: Virtual Museum Builder)

Projects executed during 2005-2008

Objective of the Project:

- Digital Preservation, Cataloging and Management of museum antiquities

Details:

- **JATAN: Virtual Museum Builder** software is basically a digital collection management system specially designed for museums.

Above software solution is deployed and being used by following museums.

- **Salar Jung Museum, Hyderabad** (Old data of 50,000 antiquities is migrated to JATAN in 2008)
- **Prince of Wales of Museum, Mumbai** (JATAN user since 2005)
- **Raja Dinkar Kelkar Museum, Pune** (JATAN user since 2005)

Digital Preservation Case Study –02

Archaeology (JATAN: Virtual Museum Builder)

Elements of Digital Preservation and Specs.	Today's Status
<p>1. Digitization – High Resolution (14 mega pixel photos) 24 BIT, RGB True Color, Uncompressed TIFF, JPG File format</p>	<ul style="list-style-type: none"> • Content is intact and source files are usable
<p>2. Collection Management Software – JATAN: Virtual Museum Builder</p>	<ul style="list-style-type: none"> • Open source web technologies JAVA, J2EE Servlets, JSP, HTML • Salar Jung Museum started digital cataloging in 2002 using a software developed in Visual Basic. It is not running properly on recent versions of Windows. They have now migrated to JATAN system.
<p>3. Web Application Server – Macromedia JRUN</p>	<ul style="list-style-type: none"> • Macromedia bought by Adobe in 2005 • JRUN support continued by Macromedia but no plans to develop this product further
<p>4. Migration Path for Web App Server -</p>	<ul style="list-style-type: none"> • JATAN System is made suitable to run using TOMCAT Web Application Server (open source)
<p>5. Multimedia Documentation– (Not used by any museum so far)</p>	<ul style="list-style-type: none"> • Multimedia file formats are supported- PPT, WAV, MP3, MPEG, AVI, PDF, SWF, EXE, QTVR, VRML, CO

Digital Preservation Case Study -02

Archaeology (JATAN: Virtual Museum Builder)

Elements of Digital Preservation and Specs.	Today's Status
6. Display Resolution of dynamically generated website of JATAN -	<ul style="list-style-type: none">• 1024 by 768 pixels• Presently acceptable but may not be suitable in future (Liquid layouts are recommended)
7. Source Code -	<ul style="list-style-type: none">• Open source code
8. Maintenance of Source Code –	<ul style="list-style-type: none">• Regular documentation and backup
9. Parameters for Metadata Description -	<ul style="list-style-type: none">• Collectively evolved by involving domain specialists from various museums
10. Metadata Standard –	<ul style="list-style-type: none">• Dublincore Metadata standard• Open source XML format
11. Database –	<ul style="list-style-type: none">• MS-SQL• Can be migrated to My-SQL, Postgre SQL
12. Content Integration –	<ul style="list-style-type: none">• Multimedia Content is not integrated in the database• It is maintained outside the database• Salar Jung Museum had integrated the images in the old Oracle 8 version. This data could not be re-utilized when they migrated to JATAN system.

Digital Preservation Case Study -02

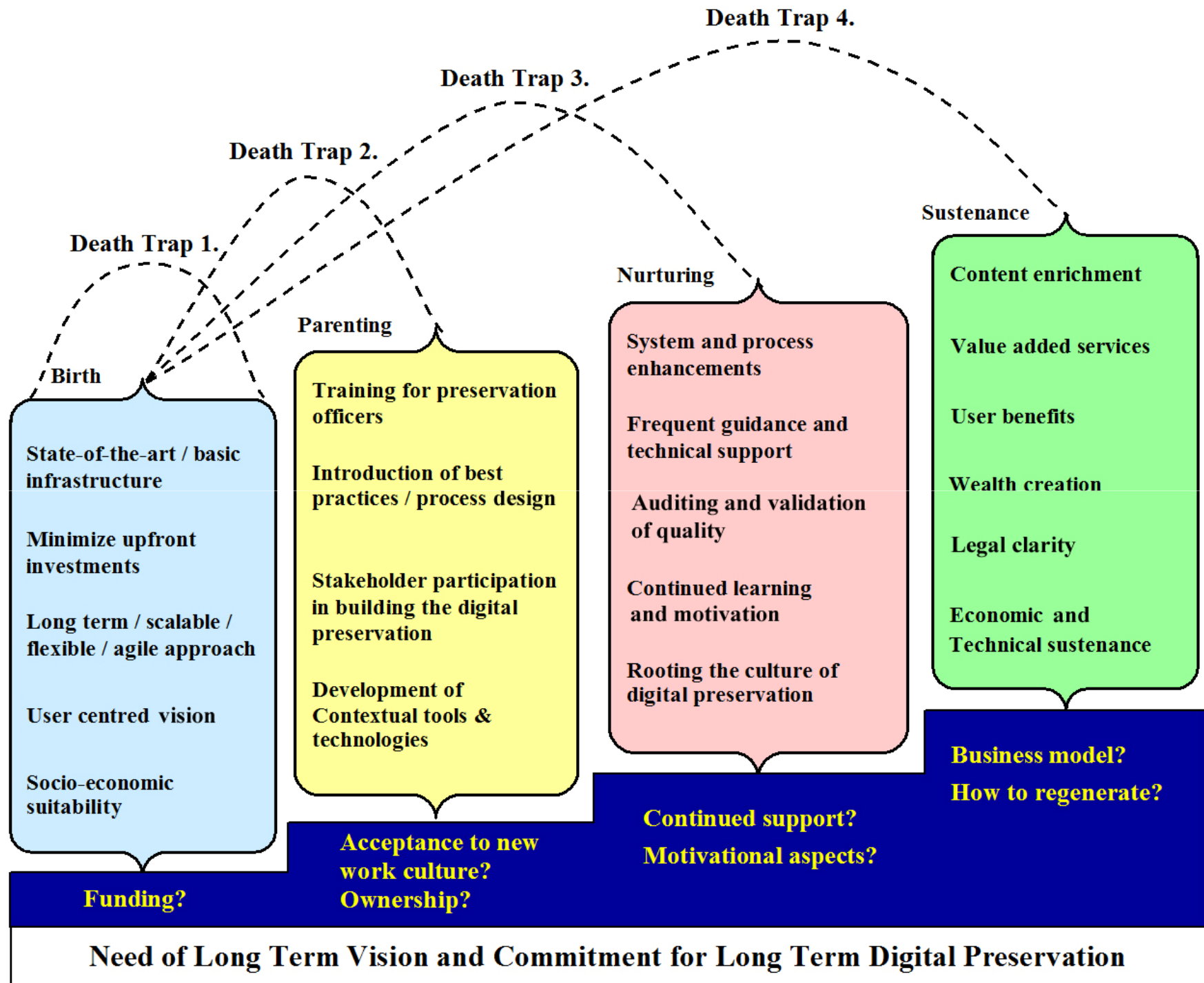
Archaeology (JATAN: Virtual Museum Builder)

Elements of Digital Preservation and Specs.	Today's Status
13. Delivery of Application –	<ul style="list-style-type: none"> • Web browser based (Works well with Internet Explorer and FireFox)
14. Operating System -	<ul style="list-style-type: none"> • Microsoft Windows • Cross-platform compatibility is feasible
15. Storage –	<p>Raja Kelkar Museum</p> <ul style="list-style-type: none"> • 20,000 antiquities digitized so far • Approx. 1 Terabyte in size • Stored on local hard disk
16. Storage / Backup CDs and DVDs	<p>At Raja Kelkar Museum</p> <ul style="list-style-type: none"> • 500 CDs • 50 DVDs
17. Accessibility –	<ul style="list-style-type: none"> • Web, Kiosk, Handheld devices supported
18. Sustainability –	<ul style="list-style-type: none"> • Payment based subscriptions / rights management is supported in the software
19. Value added applications -	<ul style="list-style-type: none"> • Thematic catalogues, virtual galleries / exhibitions are possible

Archaeology (JATAN: Virtual Museum Builder)

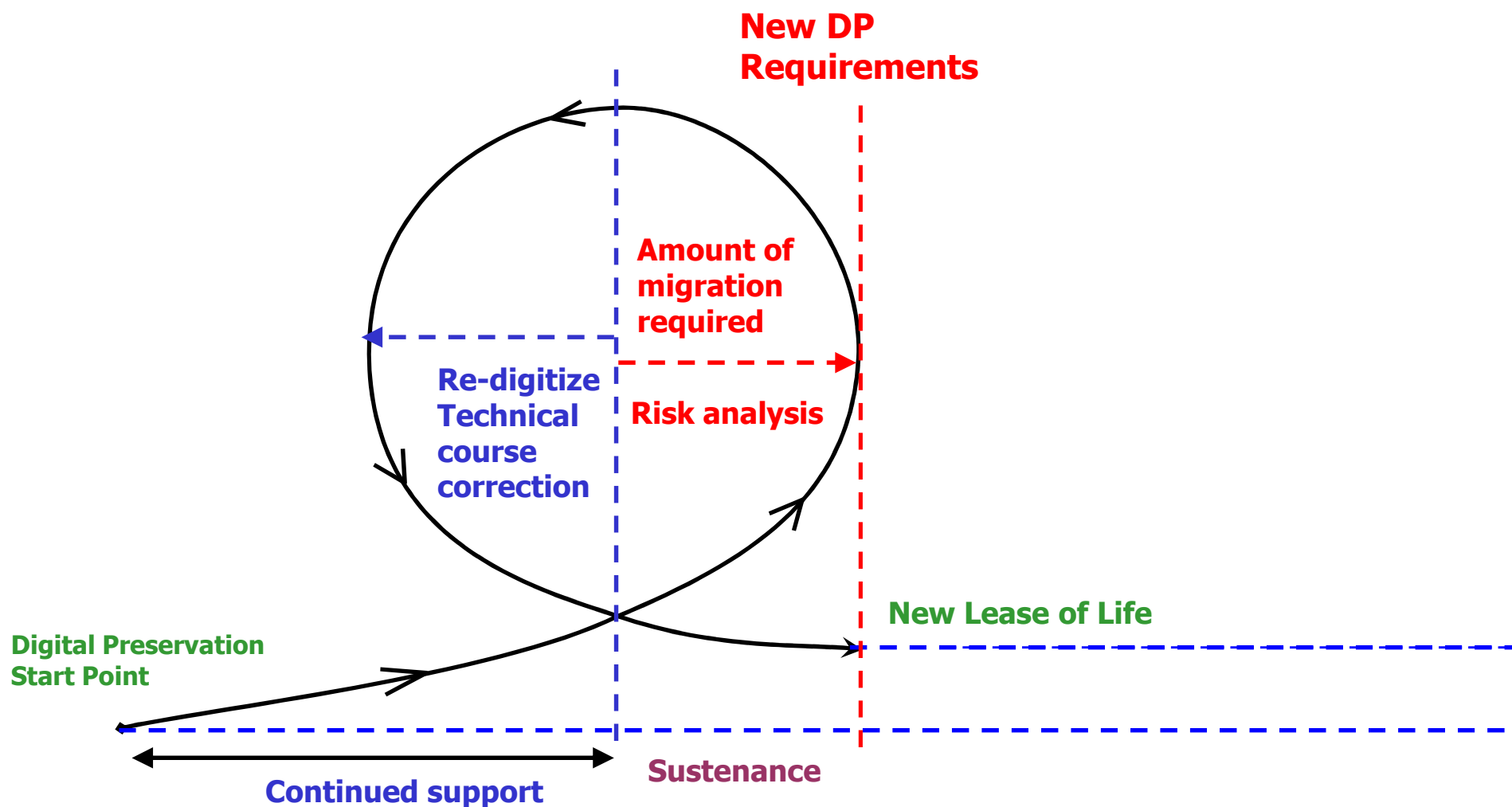
Lessons for Long Term Digital Preservation

- **Use open source programs for developing the software for collection management**
- **Follow the international standard for metadata description**
- **Use open source web application server and database**
- **Avoid integrating the content as part of database**
- **Use multimedia formats for all round documentation and preservation**
- **Don't make upfront investments in storage devices unless the data size demands it**
- **Sustainability and value added services must be addressed in the overall solution**



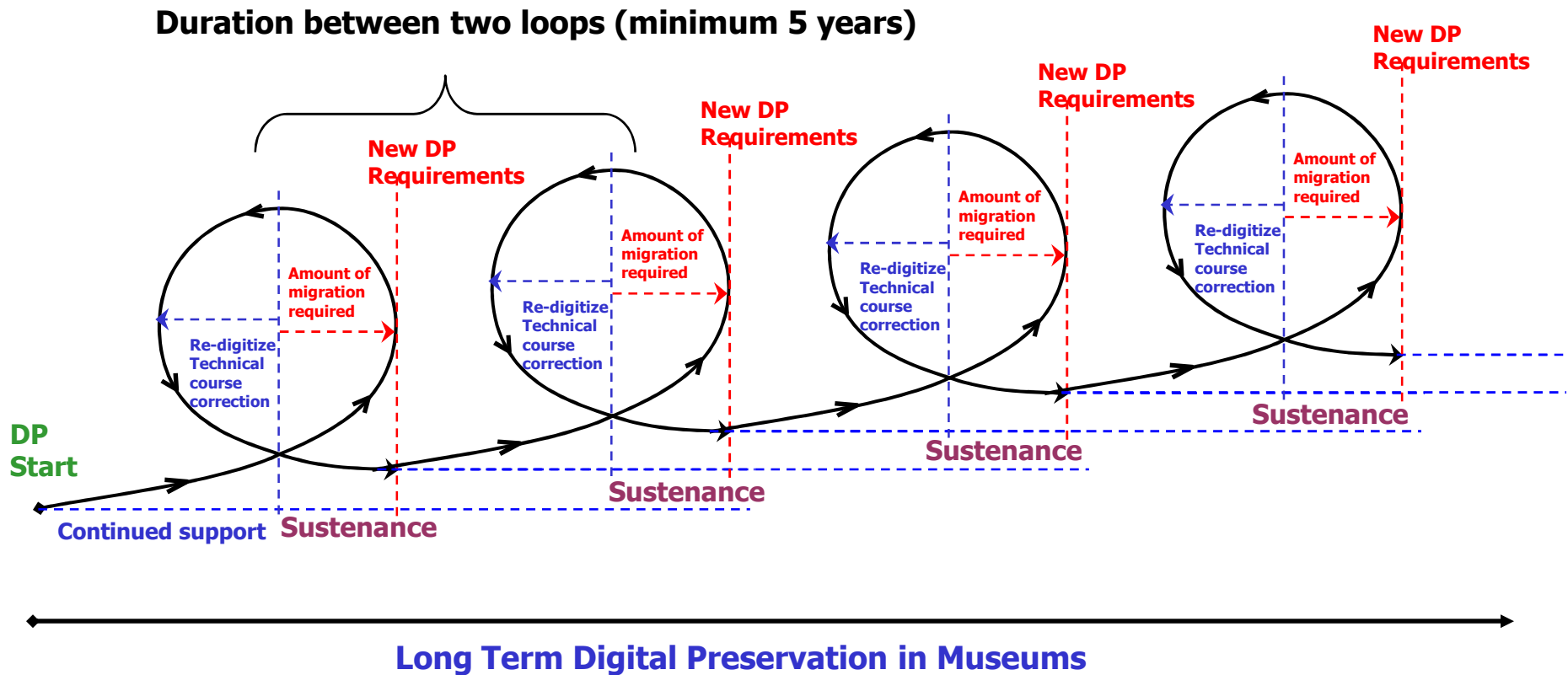


Loop shaped Lifecycle Model for Digital Preservation





Loop shaped Lifecycle Model for Digital Preservation





Summary

- Indian government should plan for creation of proper ecosystem along with long-term commitment to sustain the entire lifecycle of long-term digital preservation.
- Short-term plan with short-term commitments will never lead to long-term digital preservation.



Thank You 😊



National Digital Preservation Programme
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