

## Paradigm Shifts in the Conservation of Electronic Art

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## How long we keep things

- Companies keep information for **days, or even years**
- Individuals keep things for **years, or a lifetime**
- Archives, Libraries, and museums keep things for **hundreds of years**

*Cultural Institutions have a much greater responsibility for preservation!*

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## But who is preserving today's "born-digital" works?

- **In the past, we knew about history by finding written documents:**
  - Changes between different drafts of a scientific or literary paper
  - Letters and correspondence between a scientist (or literary figure) and colleagues (that both helps contextualize the work, and lets us see changes in thought processes or discovery)
- **But today, these documents are not on paper! They are in the form of:**
  - Email correspondence
  - Word processing files that do not show changes between drafts/versions
- **Who will take responsibility to save these works for future study?**

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## Paradigms Shifts needed

	<u>Old</u>	<u>New</u>
<b>Physical preservation</b>	atmospheric cntrl	ongoing mgmt
<b>What to save?</b>	artifact	idea + ancillary material & documentation
<b>Cataloging</b>	Individual work in hand	FRBR
<b>Later access</b>	Artifact & documentation	Restaging, ancillary material & documentation

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## Paradigm Shifts in the Conservation of Electronic Art-

- How are new works even more problematic than older forms of moving image material?
- Issues with Digital Preservation
- Issues with New Works
- Technical & Conceptual Approaches to solutions
- Efforts to watch (projects, standards)
- **Paradigm shifts needed**

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## Conventional Works

- Manuscripts, books, paintings, sculpture
- We have a good sense of what the original object is
- Objective is to make object itself endure (temperature /humidity control, chemicals/pigments/fibers/adhesives, ...)
- Goal is to keep object as close as possible to original state (though occasionally controversy arises over whether to let aging show)

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## Electronic Media

- Video, audio, digital, new media
- Often difficult to determine what the original object is
- Difficult to make the original object endure (magnetic particle deterioration, warping, etc.)
- Even if we could make the original object endure, we wouldn't have the infrastructure to view it in the future
- Need to develop a paradigm shift from preserving the original object to preserving info content
- Need to pay more attention to maintaining authenticity and replicating user experience

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7

## Electronic Art in general is not like canvas paintings

- May include
  - Moving image materials
  - Multimedia
  - Interactive programs (including hypertext novels & games)
  - Computer generated art
- Most electronic art works share some common characteristics with other “strange” works like
  - Performance Art
  - Conceptual Art
  - Site-specific installations
  - Experiential Art

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8

## The Short Life of Digital Info: Digital Longevity Problems-

- ✿ Disappearing Information
- ✿ The Viewing Problem
- ✿ The Scrambling Problem
- ✿ The Inter-relation Problem
- ✿ The Custodial Problem
- ✿ The Translation Problem

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9

## The Viewing Problem

- ✿ Digital Info requires a whole infrastructure to view it
- ✿ Each piece of that infrastructure is changing at an incredibly rapid rate
- ✿ How can we ever hope to deal with all the permutations and combinations

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10

## The Scrambling Problem

Dangers from:

- ✿ Compression to ease storage & delivery
- ✿ Container Architecture to enhance digital commerce

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11

## The Inter-relation Problem

- ✿ Info is increasingly inter-related to other info
- ✿ How do we make our own Info persist when it points to and integrates with Info owned by others?
- ✿ What is the boundary of a set of information (or even of a digital object)?

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12

## The Custodial Problem

- ✿ In the past, much of survival was due to redundancy
- ✿ How do we decide what to save?
- ✿ Who should save it?
- ✿ How should they save it?-

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## The Custodial Problem: How to save information?

- ✿ Methods for later access
  - ✿ Refreshing
  - ✿ Migration
  - ✿ Emulation
- ✿ Issues of authenticity and evidence

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## The Translation Problem

- ✿ Content translated into new delivery devices changes meaning
  - -A photo vs. a painting
  - -If Info is produced originally in digital form in one encoded format, will it be the same when translated into another format?
  - Behaviors

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The Translation Problem

## Thinking of the Future (1/2)

- Screens will be different resolutions and different aspect ratios
- CRTs won't exist
- A decade or 2 from now, today's user interfaces will look like arrow-key navigation looks like today

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The Translation Problem

## Thinking of the Future (2/2)

- Today's streaming media are small windows, slow speeds
- As bandwidth increases, viewers will expect higher quality streams
- Creators may need to consider how they'll be able to deliver higher-bandwidth streams
  - Delivery Derivatives vs. Masters encoded w/standards
  - May also want to re-edit the piece to take advantage of changes in technology, viewer expectations, society-

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## Screen Formats



## Responding to serious Longevity Problems

- ❖ Previous formats required little ongoing intervention (remote storage facilities, Iron Mtn); digital formats require intense ongoing management
- ❖ Need for:
  - ❖ Preservation Repositories
  - ❖ Preservation Metadata

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19

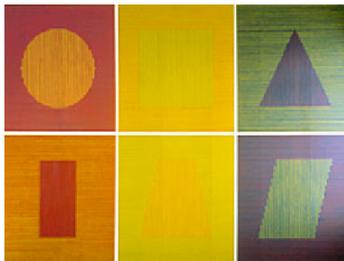
## Issues with new works-

- What is the work?
- Complexity of rich media
- Difficulty of making the work last

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20

## LeWitt: Wall Drawing 340



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21

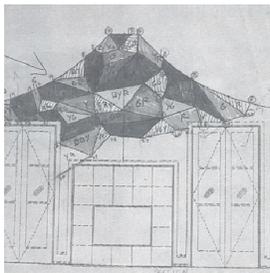
## Installing LeWitt



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22

## LeWitt Install Directions



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23

## LeWitt: What do we save?

- The installation?
- Documentation of the Installation?
- The directions for the Installation?
  
- What is the goal of our documentation and preservation?

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24

### ECI - Imagespace (early 80s)



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25

### ECI - Hole in Space (both)



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26

### ECI - 84-locations



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27

### ECI - 84-Community Memory



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28

### ECI - 84-kids



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29

### ECI - 84-MOCA



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30

## ECI - 84-Annotating Video



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31

## Complexity of Rich Media

- Works often have artistic nature (including video games)
- Enormous number of elements can, at times, be very important to preserve (pacing, original artifact, elements used to construct the artifact)
- Too complex to save every one of these aspects for every type of material
- Importance of saving documentation

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32

## Special Characteristics of Electronic Works

- What Really is the Work?
- Disappearing software
- Enormous number of elements can, at times, be very important to preserve (randomness, interactivity, pacing, color, format, original artifact, elements used to construct the artifact)
- Pieces and Boundaries
- Recontextualization (Postmodernism)--which rendition to save?
- Dynamic & Lack of Fixity (evolving works)
- Interactivity
- Historical context
- Difficulty of authentication over time

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33

## Documentation & Preservation: What are we trying to do?

- Show the work the way people saw and interacted with it when it was first created

(may be impossible; in the past, the artifact and how one interacted with it didn't change much, so preservation and documentation were relatively straightforward)

- Show documentation of the work and people interacting with it when it was first created
- Reinstall/Recreate/Reinact the work

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34

## What can we do specific to Electronic Art?

- Works themselves may no longer even exist; in many cases, what we can save amounts to forensic evidence
- Enormous number of elements can, at times, be very important to preserve (pacing, original artifact, elements used to construct the artifact)
- Too complex to save every one of these aspects for every type of material
- Importance of saving pieces, representations, and documentation
- Involve the artists to capture their intentions
- Importance of Standards
- Familiarize ourselves with recent conservation developments (Who Knows?, TechArcheology, Tate, IMAP)

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35

## Technical & Conceptual Approaches to Solutions-

- Save the Hardware & Software
- Emulate
- Migrate
- FRBR
- Artist Intentions

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36

## Save the Hardware & Software-

- A huge undertaking
- Computer Museum
- Broderbund

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37

## Old Video Formats



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38

## Old Digital Formats



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39

## Save the Hardware & Software

- A huge undertaking
- Computer Museum
- Broderbund

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40

## Possible endless need for reformatting implies

- Possible loss with each generation
- Requires managed environment

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41

## Approaches to Solutions-

- ~~Save the Hardware & Software~~
- Emulate
- Migrate

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42

## Conceptual Approaches to Digital Preservation

- **Refreshing** always necessary due to volatility of physical strata
  - Impact on evidential value
- **Migration** -- advantages & disadvantages
- **Emulation** -- advantages & disadvantages
- And will need a long-term managed environment

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43

## Migration

- Wordstar to Word 1 to Word 3, ...
- -Tables and complex features often get corrupted
- -Need to repeat every 4-5 years (maybe forever)
- +We know how to do this ourselves
- +If there's a problem, we can catch it soon

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44

## Emulation

- Keep the Wordstar file format, but write emulators to make it work in newer environments
- +A better chance of carrying over complexity
- +Many more features can survive
- -Problems may not be caught until it's too late
- -Specialists and a whole infrastructure of emulators required
- -Serious © problems (reverse engineering?)

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45

## Managed Environment

- More than temperature & humidity control
- Periodic monitoring of the works
- Periodic monitoring of the technical environment for viewing the works (software, systems, hardware)
- Trusted repositories

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46

## Incorporate parts of Functional Requirements for Bibliographic Records (FRBR)

- work
- expression
- manifestation
- item

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47

## Standards for encoding creators' intentions

(group efforts w/i Cult Heritage community)

- Matters in Media Art--New Arts Foundation, MOMA,SFMOMA,Tate
- DOCAM
- INCCA
- Past
  - Seeing Double Exhibition, & Symposium
  - Variable Media Initiative
  - Artists Interviews Project, Netherlands Institute for Cultural Heritage 1998-1999, **Modern Art: Who Cares** (<http://www.icn.nl/english/6.4.2.html>)
  - TechArcheology: A Symposium on Installation Preservation (SFMOMA)

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48

48

## A few questions our community should address

- Special issues raised by non-library institutions
- Special issues raised by images and rich media
- What is the work (or salient points we need to preserve)?
- Bring the arts communities (artist intent, BAVC) together with the preservation repository communities and the preservation metadata communities
- Specifically get Cult Heritage communities involved with the selected OCLC/RLG recommendations
- Get cult heritage groups started on working to make sure that structure standards incorporate our works
- What organizations will take responsibility to save today's digital "ephemeral" materials (online 'zines, arts discussion groups, etc.)?

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49

## Standards, Metadata, & Best Practices to follow-

- Risk Management
- Best Practices for Reformatting
- Preservation Repositories & Metadata
- Other Metadata & Standards

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50

## Risk Management

- We can't say definitively that we can make every digital work persist
- What we CAN say is that the more a digital work conforms to standards and best practices, the greater the likelihood that we can assure persistence
- Our preservation repositories can even accept deposits of non-conforming works, but the less they conform, the less likely that they'll be salvageable
- Persistence is most likely for works that share standards, metadata, and best practices

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51

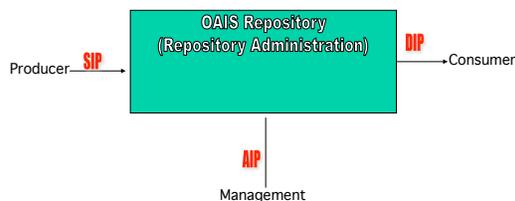
## Reformatting Best Practices (still images)

- Think about users (and potential users), uses, and type of material/collection
- Scan at the highest quality that does not exceed the likely potential users/uses /material
- Do not let today's delivery limitations influence your scanning file sizes; understand the difference between digital masters and derivative files used for delivery
- Many documents which appear to be bitonal actually are better represented with greyscale scans
- Include color bar and ruler in the scan
- Use objective measurements to determine scanner settings (do NOT attempt to make the image good on your particular monitor or use image processing to color correct)
- Don't use lossy compression
- Store in a common (standardized) file format
- Capture as much metadata as is reasonably possible (including metadata about the scanning process itself)

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52

## Preservation Repositories: Open Archival Info System Model



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53

## OCLC/RLG Digital Repository Attributes

- Administrative responsibility
- Organizational viability
- Financial sustainability
- Technological suitability
- System security
- Procedural accountability

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54

## OCLC/RLG Selected Recommendations

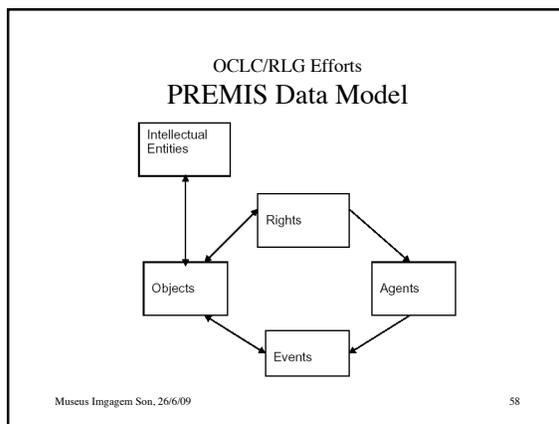
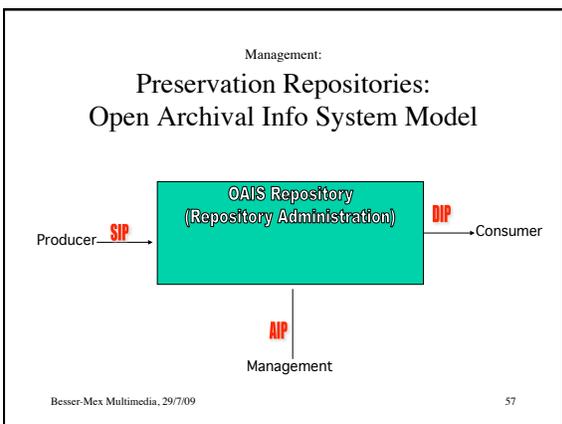
- Policies, Certification processes, Risk management, Persistent ID, Migration/Emulation experiments
- Stakeholders meet to decide how to describe what is in a dig repository
- Examine special properties of particular classes of digital objects
- Technical standards for exchange and interoperability btwn repositories
- Develop projects and case studies
- Copyright issues

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## Preservation Repositories: too difficult for small institutions

- Too complex for small institutions to manage
- Will be done through partnering (small museum with University) or through consortia (museum association, state-wide organization, ...)
- Archive or museum will direct what is needed, but digital repository will carry out the actual work (as defined in SIP/DIP/AIP)

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OCLC/RLG Efforts  
PREMIS Data Dictionary Example

<b>Semantic unit</b>	fixity		
<b>Semantic components</b>	messageDigestAlgorithm, messageDigest, messageDigestOriginator		
<b>Definition</b>	Information used to verify whether an object has been altered in an undocumented or unauthorized way.		
<b>Data constraint</b>	Container		
<b>Object category</b>	<b>Representation</b>	<b>File</b>	<b>Bitstream</b>
<b>Applicability</b>	Not applicable (see image note)	Applicable	Applicable (see image note)
<b>Repeatability</b>		Repeatable	Repeatable
<b>Obligation</b>		Optional	Optional
<b>Creation/ Maintenance notes</b>	Automatically calculated and recorded by repository.		
<b>Usage notes</b>	<p>To perform a fixity check, a message digest calculated at some earlier time is compared with a message digest calculated at a later time. If the digests are the same, the object was not altered in the interim. Recommended practice is to use two or more message digests, calculated by different algorithms.</p> <p>The act of performing a fixity check and the date it occurred would be recorded as an Event. The result of the check would be recorded as the eventOutcome. Therefore, only the messageDigestAlgorithm and messageDigest need to be recorded as objectCharacteristics for future comparison.</p>		

Museum Image 59

## Other Standards/Metadata Areas

- Synchronicity between media/streams
- Performance Archive & Retrieval Working Group
- Performing Arts Data Service (PADS)
- Persistent Ids-
- Website mgmt-
- Technical Imaging Metadata-
- Structural & Administrative Metadata-
- Complexity of formats (storage & compression)-
- Crosswalking Metadata-

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## Persistent IDs--the Problem

- Need to separate work ID from work location
- URNs probably won't be ready until 2003
- Becomes a business process issue when one organization maintains the resource and another organization references it (ie. licensed from vendors or managed by separate administrative structures)

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61

## More Persistent IDs --the Approach for today

- PURLs
- Handles
- HTTP redirects
- And worry about costs now and conversion costs when URNs become feasible

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62

## Website Management More issues with referencing IDs

- References for mirror sites
- References for back-up sites when main site is down or bottle-necked
- References for off-site copies and archival copies

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63

## Ideal digital moving image file format

(Jerome McDonough)

- Non-proprietary file format
- supports 10-bit/pixel
- no compression or lossless compression using non-proprietary CODEC
- supports multiple frame rates/frame sizes
- supports time code data in file
- supports audio (multichannel) and video in single file

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64

## Limitations of present file formats

- MPEG seems to be only non-proprietary format
- AVI and Quicktime with extensions incorporate most features, but are proprietary
- Not enough companies produce encoders for Motion JPEG 2000 for us to feel comfortable about its long-term sustainability

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65

## Many quality questions

- Quality of playback?
- Theater experience?

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66

## What about newer formats & developments?

- Moving images on DVDs becoming interactive; need for more extensive source materials
- Video installation works
- Net-based works incorporating moving images
- Images & rich media; new media and multi-media works
- Inter-relationships btwn parts
- For Contemporary Art: What is the Work?-

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67

## Which should be reformatted to digital today?

- Born digital--need to be kept in digital form
- Video--probably; at least soon
- Film--Not very soon
- A guessing game; we need more R&D, as well as education

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68

## Other Digital Preservation Activities /Projects-

- ✿ LC Natl Dig Info Infrastructure & Preservation
- ✿ InterPARES
- ✿ Electronic Literature Organization
- ✿ Emulation Projects
- ✿ ERPANET

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69

## LC's National Digital Information Infrastructure and Preservation Program (NDIIP)

- Authorized Dec 2000
- LC, Dept of Commerce, NARA, White House Office of Sci & Tech Policy
- with help from CLIR, NLM, NAL, OCLC, RLG
- Ongoing collab process
- Commissioned papers on preserving: the Web, periodicals, digital sound, E-Books, Digital TV, Digital Video
- Awarded grants for "Building a Network of Partners" phase (up to \$3 million) (Oct 2004)

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70

## Research: NYU/Public Television Project

- Preserve a broad set of elements (including ancillary material)
- Life-cycle mgmt (add metadata as soon as a clip comes in)
- Establish a community of stakeholders, working together for preservation (stations, university, librarians, journalists, historians, producers, scholars, ...)
- Build an OAIS Server
- Explore appropriate file formats, wrappers, METS extensions
- Develop sustainable business model

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71

## CLIR/NDIIP Issue Areas

- Technical and architectural infrastructure (standards, ID, obsolescence)
- Economic and legal (rights mgmt, funding)
- Collection Development (what gets saved?)
- Societal & Institutional (who does what, role for commercial sector)

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72

## InterPARES 2

International Research on Permanent Authentication Records  
in Electronic Systems

- Ongoing international archival world project examining how to make electronically-generated records last over time
- Developing the theoretical and methodological knowledge needed, then will formulate model policies, strategies, and standards
- Reliability, accuracy, authenticity
- In 2003 was extended to include dynamic, interactive, and experiential works

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73

## Emulation Projects

- CAMiLEON (Michigan/Leeds)
- NEDLIB

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74

## Electronic Resource Preservation and Access NETwork (ERPANET)

- Best practices and skills development for digital preservation of cultural heritage and scientific objects
- 3 year project launched Nov 2001; 1.2 million Euros

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75

## Persistent Naming

- ✿ URNs
- ✿ Handles
- ✿ PURLs
- ✿ Re-directs

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76

## Student Projects NYU's Moving Image Archiving & Preservation

- Examples of some steps taken towards capture & preservation of complex works

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77

77

Digital Preservation class:

## Assessing an old Website



Handle News Center being  
Host of New Information Resources: Multimedia and Networks

Note to the U.S. Berkeley community: Most of the files herein have been captured on video and are  
available for download on <http://www.berkeley.edu/~lib/berkeley.com/berkeley/>

### List of Speakers:

Christy Spink, Sibley (Fall 1996)

Chris Carlson

The Making of Text in Cyberspace: New Media and Knowledge

Sven Oskar

Community, Networks, Building Electronic Circles

K. D. Davis

The Multimedia Subject and the Virtual Body in Cyberspace: Cyberspace and the Subject

Michael Fiske

From the Site of Electronic Images for the Arts and the Humanities

Lee Folsom

The Community of Information

Margaret

The Cultural Space of Computers in Art Production: Thoughts on Digital and Interactive Art

Lee Folsom

Multimedia in Theater and Theater in Multimedia

Michael

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78

78

Digital Preservation class:

## Assessing an old Website

- Producer's Intention
- Physical Characteristics
- Structure
- Risks
- Documentation
- Recommendations

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Digital Preservation class:

## Assessing an old Website-Structure

- The size of the Fall 1999 directory is 11.4 MB. There are three subfolders in the Fall 1999 directory: 1) **nreview**; 2) **Focus**; 3) **Papers**. Within the **nreview** folder are three subfolders: 1) **napper**; 2) **nkirby**; 3) **steecker**. In the **Focus** folder are five subfolders: 1) **Arts**; 2) **Policy**; 3) **MedTech**; 4) **Film**; 5) **Virtual**. In the **Papers** folder are five subfolders: 1) **napper**; 2) **becker**; 3) **kirby**; 4) **protected**; 5) **change**. The entire directory has the following file types and corresponding number of files:
  - HTML documents – 174
  - Microsoft Word documents – 7
  - Unix executable file – 1
  - Plain text document – 1
  - Document (.ppt copy) – 1
  - .git – 36
  - .pdf – 3
  - .jpg – 1

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Digital Preservation class:

## Assessing an old Website-Structure

◦Lecture Series

- Information on where to get copies of lectures
- Current Speaker Series (NOTE: Fall 1994—links to different list of speakers than the one given on this page)
- [21 functional internal links to information on speakers. Most pages have broken internal links.]

◦The Students from LIS296A

- NOTES: All student pages have a broken link to return to the main student page, which links to the Berkeley server. Also, many photos on the student pages do not appear. Two students listed do not have links to their pages. Names are given in reverse alphabetical order, as below.
- Howard Besser
  - Link to Howard's bio (w/redirect to current NYU page)
  - Link to the class website (broken—redirects to Howard's main web page)
  - [two functional links to papers, one to—Howard's bio]
- Natalie Zee
  - [five broken internal links directing the browser back to the original Berkeley server]
  - A link to a "Seinfeld Mosaic Server"—broken

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Digital Preservation class:

## Assessing an old Website-Recommendations

- In order to preserve the website in its current form (more on the question of "currency" below), the following actions are recommended:
  - Review all links in the Fall 1993 section and replace any remaining absolute links to content within the site with appropriate relative links
  - Review content of site to determine which content is actually from Fall 1993, and which was revised in 1994
- This second point raises questions of "currency", due to the fact that, prior to 1995, the site's content was not maintained in a coherent manner, and thus, for all intents and purposes, the original Fall 1993 version of the site no longer exists. Its current form is one that was altered between 1993 and 1999, on occasions and by persons not entirely clear at this point.
- The question is: should an attempt be made to return the site to its original state, or to preserve its "current" form? I would argue for maintenance in its current state, for several reasons; first, the near-impossibility of an accurate reconstruction. A search could be made to see if any of the original, unaltered html and graphics files dating to 1993 still exist in any form—a dubious proposition at best. If they do not exist, reconstructing the original 1993 site would require reliance on the recollections of Howard Besser and the original students, as well as any paper documentation or notes that survive—to my mind, an equally dubious proposition due to the improbability of accurate re-creation. Second, the site's current state is a valuable document of how web sites evolved in the earliest years of the web—including the somewhat chaotic state of the earliest pages. Certainly the original 1993 site would be a valuable document, but to re-create it within the confines of the extant site would require altering an extant, authentic document by adding one generated a decade after the fact, using necessarily unreliable information.
- Instead, I would argue that documenting and contextualizing the site's content and changes over time would be preferable to any attempts at reconstruction; thus I recommend:

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## Preserving Eyebeam's ReBlog

(Patricia Smith project)

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## Preserving Eyebeam's ReBlog

(Patricia Smith project)

- Description of the component parts
- The archive
- Risk assessment
- Possible preservation strategies
- [http://www.eyebcam.org/reblog/journal/archives/2005/06/preserving\\_the\\_dynamic\\_by\\_pamela.html](http://www.eyebcam.org/reblog/journal/archives/2005/06/preserving_the_dynamic_by_pamela.html)

Besser-Sweden Preservation, 16/2/07 84 84

## Website Preservation Tools Archive-It

- Build, manage, & search own web archive through user-friendly web application
- No need for technical expertise or file-hosting
- Subscription service of Internet Archive
- Designed for archives, museums, libraries, educational institutions, state organizations, individual researchers
- <http://www.archive-it.org/>

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16/2/07

85

85

## Website Management More issues with referencing IDs

- References for mirror sites
- References for back-up sites when main site is down or bottle-necked
- References for off-site copies and archival copies

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86

86

## Re/Collecting: A Centennial Installation By Simon Attie with Norman Ballard

### Jewish Museum (Internship)

- Projections of art objects hovering in free space, and evocative texts that materialize as if written by an unseen hand, greet visitors to a dramatic, enclosed environment created in The Jewish Museum by artist Shimon Attie in collaboration with Norman Ballard, as a new artwork commissioned for the Museum's centennial. The sound design by Bill Toles. Presented in two "chapters," the artwork evocatively juxtaposes images from the Museum's collection and fragments of texts. *Re/collecting: A Centennial Installation* by Shimon Attie with Norman Ballard, in which three-dimensional projections and laser writing magically call up objects and snippets of language from The Jewish Museum's past, is in the contemporary gallery of the permanent exhibition. The words and images have been selected to suggest the conversations about art, culture, identity and history that have been at the heart of The Jewish Museum over the last century. The second chapter, featuring works from the Museum's collection related to Hanukkah, remains on view through January 16, 2005.

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87

87

## Jewish Museum (Internship)



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16/2/07

88

## Preservation Plan for a small Video Archive

(L.A.V.A. by Paula Felix-Didier)



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31/3/08

89

89

## L.A.V.A.--Phase 2

- Long-range preservation plan.
- Natural disaster plan.
- Insurance.
- Climate controlled storage.
- Regular tape inspection schedule.
- Plan on start collecting DVDs and migrating the most valuable VHS to DVD or other digital format.
- Digitizing plan for their Betacam Masters.
- Start collecting digital masters.
- Paper-based documentation preservation plan.

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90

90



## Thesis Projects (2009)

- Found in the Trash: A Collection Assessment of Dischord Records, Peter Oleksik
- Investigating Paul Sharits: Issues in the conservation and preservation of time-based media installation art, John Passmore
- The YouTube Archivist: Bringing Archival Methods to a Non-Archival World, Crystal Rangel
- BCAT: Consolidating & Creating a Brooklyn Community Television Archive, Steven Villereal
- Phonodiscs From the Texas Borderlands: A Preservation Assessment & Consideration of Regional Modes of Production, Audrey Young

## Thesis Projects (2008)

- Night of the Blow Up: Resurrecting the 8mm movies of Mike and George Kuchar Leah Churner
- Films the Color of Blood: The Film-makers' Cooperative and the Conflict Between Cultural Stability and Avant-Gardism in the Distribution of the Perpetual Past Kathleen Maguire
- A Guide to Moving Image File Formats for Digital Archives Benjamin Moskowitz
- Digital Audio Preservation in Small-Scale Organizations: An Analysis of Core Requirements, and a Set of Tools for The Flaherty /International Film Seminars Yvonne Ng
- Capturing the Artist Interview: Interview Methodologies and Resources for Documenting and Preserving Time-Based Media Art Miwa Yokoyama
- Home Movies' Second Audiene: Re-contextualizing Silent Homemade Films- Nicole Martin

## Digital Access-Merce



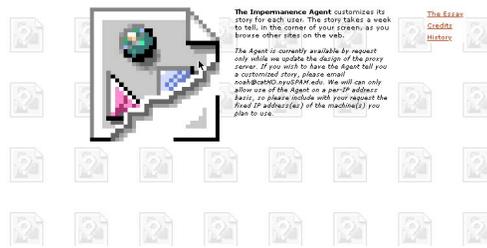
## ELO Projects-

- For older works
- For works not yet created

## ELO: Uncle Buddy's Funhouse



## ELO: Impermanence Agent



## ELO: Boyfriend Home from War



Besser-Mex Multimedia 103

## ELO Research Approaches -Retrospective

- Focus on 8 older works representing
  - Text/Java based hypertext/interactive works
  - Storyspace hypertext/interactive works
  - Hypertext/interactive works in "plain" html
  - Hypertext/interactive works incorporating more complexity (DHTML, layers, Javascript, CSS, ...)
  - Flash works
  - Director/Shockwave works
  - Interactive Fiction/Drama
  - Algorithmically-generated works
- Attempt various preservation/restoration methods
  - Archival repository to save the bits, map/storyboards, software in hopes of future restoration breakthroughs
  - Write open source code to construct viewers to read the older works on today's machines
  - Save supporting material (screen shots, videos of interactive sessions, interviews with the author/designer, interviews with users, ...)
- Examine Results
  - Review how usable the works are under each method after 3 (5, 10) years
  - Assess the cost, time, skills involved in each method

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## ELO Research Approaches- -Prospective

- Develop standards for encoding interactive behaviors, timing, etc.
- Gain community consensus for these standards
- Express these standards in terms of METS extensions and XML encoding
- Either convince vendors of authoring software to export to these standards, or design our own open-source authoring software
- Partner with a stable institution running a digital preservation repository, and use the encoded standards we develop as directions of how to handle works over time
- Develop model IP rights contracts that allow ELO to distribute a work if it's no longer in distribution elsewhere
- Convince the community of authors to place copies of their works in ELO's "dark archives"

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Conclusions for preserving all types of digital works:

## Digital Repository Traditions & Services require

- ✿ Sustainability
- ✿ Interoperability
- ✿ Access

✿ And all of these require Standards and Metadata

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Conclusions for preserving all types of digital works:

From the technological point of view

## Standards offer the best hope of overcoming Impediments

- Easier to maintain a single set of standards over long periods of time
- Puts your institution in the same large boat with lots of other institutions who will face obsolescence and migration problems periodically throughout the future

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for artistic and other challenging works:

## How Best to save these works?

- Use Standards wherever possible
- Be aggressive about asset mgmt -- saving component parts and ancillary materials
- Both creator and Archive should develop an institution-wide plan for saving electronic works
  - Refreshing and either migration or emulation
  - Standard encoding schemes
  - What is the work? And prioritize what needs to be saved
  - Save ancillary materials and records

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## What can we do specific to electronic media?

- Works themselves may no longer even exist; in many cases, what we can save amounts to forensic evidence
- Enormous number of elements can, at times, be very important to preserve (pacing, original artifact, elements used to construct the artifact)
- Too complex to save every one of these aspects for every type of material
- Importance of saving pieces, representations, and documentation
- Involve creators & curators to capture intentions
- Importance of Standards
- Familiarize ourselves with recent conservation developments (Guggenheim's Variable Media, Who Knows?, TechArcheology, Tate, IMAP)

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109

## Paradigms Shifts needed

	<u>Old</u>	<u>New</u>
<b>Physical preservation</b>	atmospheric cntrl	ongoing mgmt
<b>What to save?</b>	artifact	idea + ancillary material & documentation
<b>Cataloging</b>	Individual work in hand	FRBR
<b>Later access</b>	Artifact & documentation	Restaging, ancillary material & documentation <sub>10</sub>

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## Paradigm Shifts in the Conservation of Electronic Art

Howard Besser, NYU Moving Image Archiving & Preservation Program

- <http://besser.tsoa.nyu.edu/howard/Talks/>
- <http://www.nyu.edu/tisch/preservation/>
- <http://besser.tsoa.nyu.edu/howard/Longevity/>
- <http://www.tate.org.uk/research/tateresearch/majorprojects/mediamatters/>
- [http://www.oclc.org/digitalpreservation/presmeta\\_wp.pdf](http://www.oclc.org/digitalpreservation/presmeta_wp.pdf)
- <http://www.interpares.org>
- <http://www.guggenheim.org/variablemedia/>
- [http://www.firstmonday.dk/issues/issue7\\_6/besser/](http://www.firstmonday.dk/issues/issue7_6/besser/)
- <http://www.ifla.org/II/metadata.htm>

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