Re-collection

Art, New Media, and Social Memory

Richard Rinehart and Jon Ippolito

RE-

Art, Ne\
Richard

How w
beyon(
netize;
that nc
iMacs.
Ippolit(
art illus
describ
media,
who ca
danger(
    Ne\
conserv
their m(
teractiv
and obl
professi
dia art f
tives, ol
Nam Ju
three thi
nology,
rapidly (
which m
for oldei
cess wit
copyrigh
and law,
than ene
ervation.
and Ippc
be prese
latable ir
mats are

Persons desiring to train this faculty [of memory] must select places and fc
images of the things they wish to remember and store those images in th
that the order of the places will preserve the order of the things, and th(
the things will denote the things themselves, and we shall employ the
the images respectively as a wax writing-tablet and the letters written up(
Cicero, *De oratore*, II, lxxxvi, 354, English translation by E. W. Sutton and
ham from Loeb Classics Edition

She's gone. And the present is trivia, which I scribble down as fucking not
Character of Leonard Shelby from the film *Memento*

12 Checking In

Richard Rinehart

The variable media preservation approach Jon and I have presented so far invites critiques, debates, and open-ended questions. Below, I present some of these and, by pulling on these threads, suggest a future research agenda.

Separating the David from the Marble

One counterargument to this approach holds that it would be wrong to treat works of media art as if they were as variable as any other computable function. This view holds that the materiality of these artworks, in the form of their equipment and any other physical manifestations, is important, and that to split the physical from the logical in art would be like separating Michelangelo's *David* from the marble of which it is made. This is certainly true of some artworks (*David*) but not of all (*Unreliable Archivist*), and is true of some components of artworks but not others. What we need, in order to address this concern, are preservation systems that spur us to record which artworks must rely on their original material manifestations and which allow variability and to what extent. It's true that a blanket approach that permits us to replace any part of any artwork in the future is irresponsible. How would we make those choices appropriately? Right now, however, what the museum world has in place is a blanket approach but with the opposite assumption: that no component of any artwork may be replaced. The preservation approach for each artwork must come instead from careful consideration of that work, and preservation systems (such as metadata standards) must prompt, explicitly document, and allow for answers without regard to a priori assumptions. This consideration is not accomplished in a vacuum, and further research into the question of new media art's materiality in relation to preservation must inform each rescue operation.[1]

The Hermeneutic Problem

Another critique of the variable approach that would allow museums to recreate artworks according to recipes devised by the artist and others is that the artwork would never accumulate a historical patina. With such constant upgrading and replacing, the artwork might be kept functioning, but it would lack any sense of historical specificity or authenticity, would become unhitched from history and historical readings. If the components of an artwork are constantly upgraded, this argument goes, there will be no material clues about its origins, and this might lead to misreadings. For instance, the artwork might employ an idea that seemed relevant and contemporary at the time of its creation but would be read differently if manifested a decade later using contemporary media or technologies.[2] The use of contemporary media invites the viewer to read the work as if it were born in the contemporary moment. For instance, Ken Goldberg's *Ouija 2000* presents the viewer with a ouija board that can be played over the Internet in collaboration (to offer a greatly oversimplified description of this multivalent project). *Ouija 2000* referenced its contemporary millennial moment; according to Goldberg, specifically the mystical overtones that accompany a millennium's passing. However, if this piece were continuously recreated using the latest technology over later years, the mystic ouija board might become uprooted from that historicity and be read by viewers as referencing, say, the ghost in the machine rather than millennial fever. Thus it is argued that re-creation compounds the hermeneutic problem of reading art out of its historical context. Cory Arcangel's *Super Mario Clouds* provides a slightly different example of this problem. In 2002 Arcangel modified a 1980s Nintendo game cartridge, stripping out all game elements except the blue sky with a few scattered clouds drifting by. When this was exhibited in the 2000s, the hardware, the widely recognizable image, and the pixelated rendering of the clouds invoked a retro-tech nostalgia. Many artworks similarly use technology that is obsolete at the time of their creation to invoke nostalgia or other readings. It is difficult enough to represent that retro effect in future exhibitions, and the difficulty would be compounded if the work were constantly upgraded to contemporary media.[3] Ironically, *Super Mario Clouds* has already been rescued once by dint of its reproducibility and variability. Arcangel writes on his website, "The original 2002 code disappeared in a laptop theft, but I wrote it again using the code posted on this website as a guide." Luckily, *Super Mario Clouds* could be retrieved from the cloud and the work is, as of this writing, in version v2k9, with no sign that all this copying and updating will destroy the work.

Let us return to the critique and consider it at face value. What if, because of these arguments, we steered clear of a variable approach and employed the preservation status quo when it comes to new media art? If an artwork remains safely locked in the past because its patina has rusted its gears and it ceases to function, we have the option of simply exhibiting its nonfunctioning remains in a vitrine. Perhaps we would also provide documentation about how the work used to function. This would make the work historically accurate but artistically inaccurate. Or perhaps, rather than exhibiting the patina and documenting the art, we could exhibit the art and document the patina. The hermeneutic problem is not new—it defines art history. We just need a fresh application of all that thinking at the intersection of new media, art, and preservation.

Just Do(cument) It

It has, at times, been argued that the best we can do is to document new media art; that this is necessary and sufficient to preserve it. It's true that, because of their ephemerality, new media artworks need to be documented even more than traditional art forms, but they need more than traditional documentation. Most documentation (a photograph of a painting, a recording of a music performance) is past-oriented, recording how the work existed at some point in history. Take for example the performance work *Imponderabilia* by Marina Abramović and Ulay in which they stand, naked, on either side of a narrow entrance to a gallery, forcing visitors to choose which one to face as they press up against them to gain entry. Sliding your nervous sweaty body against the artists' is the artwork. The videotaped documentation, even when presented on a white plinth in a gallery, is not the artwork, nor even the preserved version of the artwork.[4] In previous chapters, we've looked at a type of documentation for recording the future states of a new media artwork, but it's important not to confuse the artwork itself with either past- or future-oriented documentation. Rather, the artwork lies in the space of possibilities created by documentation. Only when documentation is coupled with action, such as storage, migration, or re-creation, does it become preservation. Of course, in many performances and other such ephemeral artworks, the artist fully intends the documentation to be considered part of the work. (Christo, famous for wrapping buildings and bridges, makes his living by selling preparatory drawings and photos of his installations.) The problem occurs when, lacking an alternate preservation methodology, museums codify the practice of positioning the documentation as a proxy for the artwork and leaving it at that. With new

Figure 12.1
Marina Abramović and Ulay, *Imponderabilia*, 1977.

Figure 12.2
Reenactment of Marina Abramović and Ulay's *Imponderabilia* by Eva and Franco Mattes, 2007. Performance, Performa '07, New York.

media art, we need documentation, we need new forms of documentation, and we need it more than ever; but on its own, it's not enough.

One Is Never Enough

Critics of a variable approach perhaps rightly assert that one document, one questionnaire filled out by the artist that outlines how to recreate the artwork, is not enough of a solution to the myriad problems in preserving media art. This is of course true. So any preservation approach, especially at this early stage in the investigation, cannot put all its virtual eggs into one basket. We must treat any new preservation methods as experiments and not wholesale replacements for more traditional records and methods. Time will tell us which methods work best. For now, we should attempt to save the original software and bitstream (as long as we can), and apply
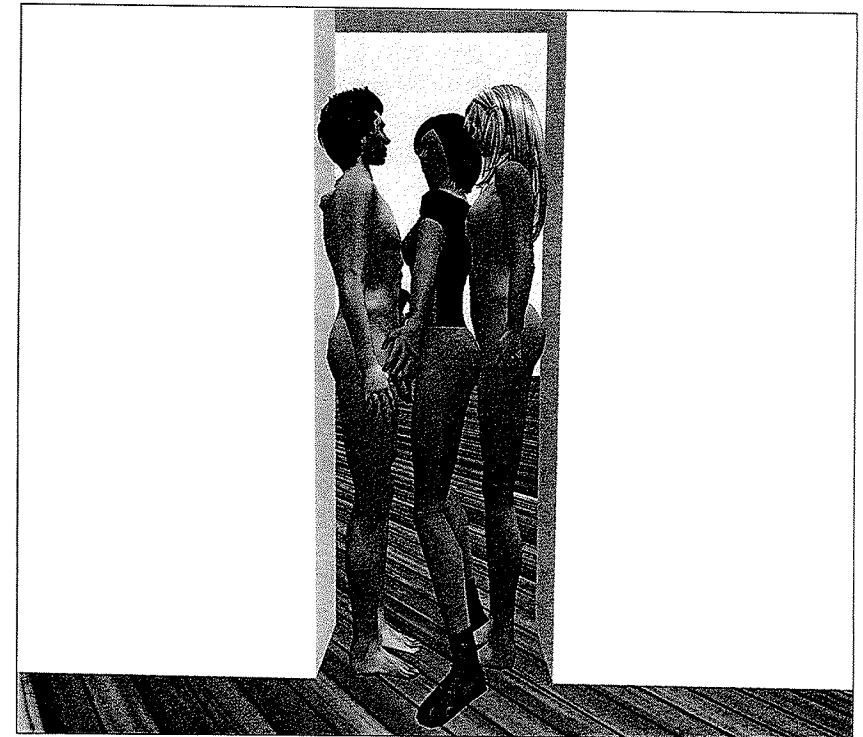
every known documentation method from interviews to conservation reports to cataloging to scores.

New Media Treadmill

Some conservationists propose that the real danger to digital artworks in particular is that their key components are invisible to the naked eye; that the critical source code for a work would become forgotten on some unreadable disk in a back corner of the archive. The proposed caution is that one cannot leave a work of digital art in the vault and come back to exhibit it once every seven years; it will have become inoperable even in that short time. One must "touch" the object continuously, upgrading it between each micro-obsolescence. This is the same migration approach taken with collections of digital documentation, such as images of

paintings, and it would seem natural for museums. The proposed solution is to keep such artworks live and active, on continuous exhibition. Researchers and the public benefit from the work's constant availability, but it is also costly. The strategy is not feasible for works that include physical components that would require dedicated gallery space. This solution may be best suited to larger museums with more resources. We need preservation solutions, like this, that allow the artwork to be continually present, but we also need solutions that allow it to go offline for a period without being doomed. Preservation solutions for media art need to be economical and tractable even for galleries, individuals, and smaller museums.

The Turing Test

Another challenge is that of proof: if we recreate an artwork in the future, how will we know if we've gone too far? How will we know if we've created an entirely new work as opposed to a new version of the original work? In a way this problem begs for a kind of Turing test for new media art. The mathematician Alan Turing (mentioned in chapter 4) proposed a way of testing artificial intelligence: a subject would be placed in a room where he or she could communicate (via text) with, but not see, two other parties, a computer and another person. If, after communicating with both, the subject could not tell which was the computer and which the person, then the computer could be said to have exhibited artificial intelligence. With media art, the analogous test might involve placing an artwork in its original medium next to a re-creation of the same work. If a viewer cannot tell the difference between them, or at least accepts the difference, perhaps the re-creation can be said to retain its integrity (such as when we hear a Bach cantata over a radio). If the variable preservation method were tested successfully on newer works—where the working original could be seen side by side with its re-creation—then we might apply this preservation algorithm to older works with some confidence. It's interesting to note that the Turing test is based on the behavior and performance of the two parties rather than on their appearance, as it is often the behavior and not the look that is defining for new media artworks. In 2004, in an exhibition titled "Seeing Double," the Guggenheim Museum presented new media artworks in their original form next to the same work in an updated format (as detailed in Jon's case notes in chapter 8). We desperately need more such preservation tests as occasions to ground the discourse in real data and to engage the public as well as professionals.[5]

Two Faces of New Media Art

The Turing test for media art and "Seeing Double" beg a common question: are they testing for the integrity of the artwork as it exists in the museum collection or as it is experienced by the viewer? The two may not always be the same. This may seem surprising; after all, a painting in the museum's collection is the same whether in the vault or in the gallery, but new media are decidedly more fluid, and this raises additional challenges to preservation. For example, consider the new media work *Landslide* by the artist Shirley Shor. *Landslide* involves source code that is compiled to generate a computer program; this computer program is what resides in the collections of the Berkeley Art Museum and the Jewish Museum in New York. When the work is shown, the program is run continuously on a computer in the gallery that is connected to a projector on the ceiling. The program generates a never-ending, never-repeating abstract pattern that flows through the projector onto a small sandbox installed on the gallery floor. The pattern resembles the shapes of a map projected onto the geography below, suggestive of the shifting sands and politics of the Middle East. The shapes are constantly evolving and colliding, never at peace, until one color in the pattern finally takes over the whole sandbox and the process starts again. What the viewer experiences as the work are the sandbox and the visual display from the projector. It would be nonsensical to try to capture a snapshot of this experience for the collection by videotaping a segment of the display. The pattern never repeats, and a recording would sorely miss the point (much the same as recording random TV signals for Paik's artwork *Crown TV*, mentioned by Jon earlier, would misrepresent that work). *Landslide* naturally exists in two states: the one that sits in the collection (a bit of software on a disk) and the one that is experienced by the viewer (the visual projection and sandbox). On which version should our preservation efforts focus? Which constitutes the "primary evidence," and which the secondary? When the wall label appears next to this work in a gallery, should it label this work as a piece of code or a multimedia installation?

Of course, museum collections are littered with variable works in traditional and nontraditional media: installation works that must be assembled for exhibition, video art that is stored in one format and presented in another. The differences introduced by new media, digital media in particular, are those of degree and volume. A new media artwork in the museum collection, like *Landslide*, may consist of a piece of source code (code that could produce many different products) that is fed a particular
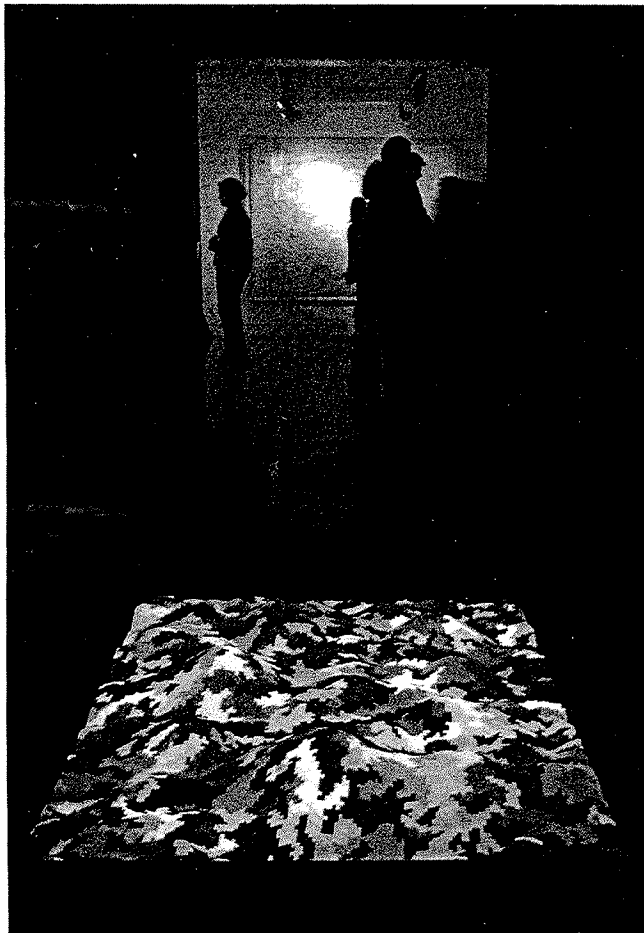
Figure 12.3
Shirley Shor, *Landslide*, 2006. Jewish Museum.

set of parameters and compiled to produce another piece of software that runs on a computer to produce a video projection. The source code and the resulting projection are so many degrees separated that the chain of context that connects them is very thin—so thin that it falls between the gaps in most existing metadata standards. These degrees of separation are compounded by the volume of variables. Author Bruce Sterling points out in the context of his Dead Media Project that while analog media formats like film suffer from mere hundreds of formats, digital media formats suffer from millions. Apple's iTunes store offers over 775,000 apps for the iOS alone, each capable of producing a proprietary file format. Multiply that by the number of different digital devices since they were first introduced, times the number of operating systems, times the number of applications, times the number of configurables, etc.: what you have is a preservation problem in which quantitative volume forces a qualitative shift, a landslide that permanently alters the geography of preservation.

Landslide demonstrates how the variable nature of new media art means that the work as collected and as exhibited may not be the same, and the space between those is an area ripe for further investigation. Nor is this situation an aberration within the genre of new media art; it is the new norm. It creates a new geography to which collectors and institutions must adjust.

13   Only You Can Prevent the End of History

Richard Rinehart and Jon Ippolito

If you've read the previous chapters as a casual observer of new media culture, your reaction may be, "Hmm, that's a different way to think about preservation." If you've read them as a working preservationist, you might be impatient for a punch line: "OK, I get that new media represent both a challenge and an opportunity for social memory. I get that new media art may have more in common with performance than with visual art, and that its boundaries may encompass environments, networks, and behaviors rather than just digital files. But you still haven't told me what to do with those demagnetizing videotapes/unreadable floppy disks/broken web servers on the shelf behind my desk!"

This book can't, and won't, prescribe a cure for every strain of technological or cultural obsolescence—those cures are as much a moving target as the technologies themselves. Instead, we've tried to offer an approach meant to outlive the examples we marshal to illustrate it.

If you care about the survival of new media culture, you can start right now to adopt this approach. We offer below a twelve-step program, broken down by profession, that should get us all on track.

Twelve Steps to Future-Proofing Contemporary Culture

1. Curators: Update Your Acquisition Policy

Implement and test some of the ideas presented earlier in this book. Despite calls to action, institutional response has been slow and scattered. Every museum, archive, or arts organization that deals with new media culture can help. You don't have to have specially trained staff or a big grant to do something; even baby steps would move us all forward.

a. Revisit your institution's collection policies. Don't assume, because your institution already collects video, that you've got new media covered. What needs to change? Change it.

b. Interview artists whenever you commission or collect a work of new media. Ideally, you'd use the Variable Media Questionnaire,[1] or another tool based on an appropriate standard like the Media Art Notation System, that will prompt questions that have been vetted in a larger community. But if you can't do any of that, just sit with the artist and ask her what she would like to see happen when her work is re-created 50 years from now. Turn on your smartphone camera and record it. Take notes on the back of the café napkins.

c. When you commission or collect new media art, put some language in the agreement that outlines who has the right to re-create or restage the work, and under what parameters (see (b) above).

d. Add 20 percent to the bottom line of your acquisition budget for each work to be put in a variable media endowment[2] reserved for the costs of future migration, emulation, and other efforts to keep the work alive.

e. When collecting new media, don't automatically demand exclusivity or limited runs. Explore alternate models with the artist. Co-collect a work with several other institutions and share the cost and responsibility while increasing access and chances of successful preservation.

f. Develop a source code escrow that protects an artist's rights while she is alive, but releases her work to the public once she is gone.

g. Obtain the help of external communities, or at least look to them, for new models. How could your museum tap into the gamer community to help preserve a work by Cory Arcangel?

## 2. Conservators: Move out of the Warehouse and into the Gallery
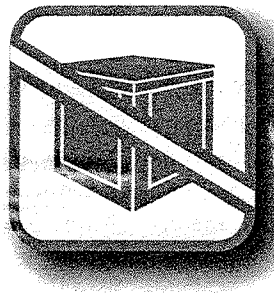
Go beyond storage to test the migration, emulation, and reinterpretation of new media artworks. Spend less money on crates and climate control, and more on funding the process of creating, and re-creating, art. Rotate your collection shows as often as possible, because exhibiting a work renews it more thoroughly than any inventory or condition check.

And the next time you exhibit a slightly worn new media artwork in a gallery, museum, or festival like the ZER01 media art biennial,

work with the artist to try one of these strategies. Document your findings and share them with all of us. Don't be afraid to talk about failures; the cultural heritage community could learn from the sciences that even negative results contribute to knowledge. The Guggenheim picked up the ball with the exhibition "Seeing Double" in 2004; DOCAM's annual conferences[3] ran with the idea from 2005 to 2010; ZKM and its partners ran still further with their exhibition "Digital Art Conservation"[4] in 2011. Complete your leg of the race.

3. Archivists: Modernize Your Metadata
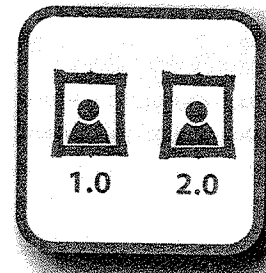
Further research, test, and agree upon metadata and documentation standards that we can all use. Standards help us by prompting us to ask the right questions, and they help us to share the answers. The Media Art Notation System (MANS) is one early attempt to articulate what is required from a metadata standard specifically for new media art and then to see how those requirements would play out as a real-world standard.

a. Feel free to copy the MANS elements when you are adding a few new fields to your collection management database.

b. Use MANS as a sounding board to develop your own documentation standard.

c. Or, instead, consider adopting an existing metadata standard to describe your new media art collection. Keep in mind the special requirements of new media art. Your standard should make explicit the parameters not only for how the work was manifested in the past, but for how it should be manifested in the future. Your standard should allow, even prompt, multiple memories of the work. More detailed requirements were outlined in chapter 5.

d. Don't get hung up on the bells and whistles of metadata that enable features that no one is using; be practical. It's more important to document and preserve the art now than to work on a standard for ten years. Look around at how your potential standard is actually being used and adapt the standard appropriately. Share your adaptation and your results.

4. Collection Managers: Renovate Your Database

Purchase, build, or find for free software tools that will allow you to gather together everything you'll need to preserve new media collections: the artist
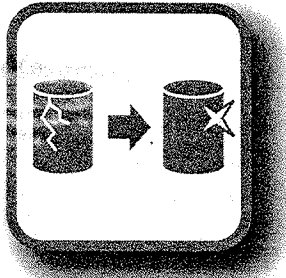
interview, alternate memories, original source files, other documentation such as video or artist emails, and descriptive notes about each component of the work. (The author, programmer, or legal rights might be different for each component of the work; don't assume that one blanket "copyright" or "artist" field in a database will always cover the entire artwork.)

a. Don't become daunted by the complexity of some museum tools. If need be, this back-end tool could just be a simple FileMaker database with fields that look like MANS elements or Variable Media Questionnaire questions.

b. If you build a tool, share it.

c. Look for tools that have already been developed. The Forging the Future project[5] hosted at the University of Maine has a suite of free databases waiting for you.

d. Commercial developers of collection management tools for cultural heritage, take note. Be the first on your block to say that your system can fully accommodate new media art.

5. Institutions: Start Collecting New Media
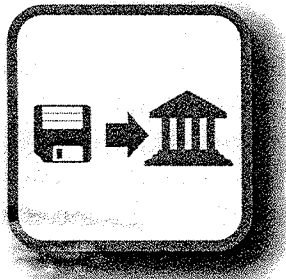
Build repositories of digital culture. Once you have one new media artwork in your care, you have a collection. Build it a home. There are detailed guidelines for creating digital repositories in the Open Archives Information Standard documentation.[6]

a. Again, don't get hung up on details while your bits die. Prototype and iterate; you'll get better each time and you'll have saved an artwork by starting early.

b. Create digital repositories that are attached to curatorial programs (such as the Walker Art Center's Digital Art Study Collection), or repositories that stand apart (such as Rhizome's ArtBase), or repositories that act as production sites (like Still Water's The Pool).

c. Look for tools made specifically for this purpose such as ccHost, an open-source tool used to create the open-source music repository ccMixter.

d. Open your system to allow memory to seep through its pores both ways, so that official, institutional memory is shared with viewers and at the same

time they contribute alternate memories of the work. Maybe viewers will contribute their remixes or entirely new works to the archive.

6. Programmers: Connect Data across Institutions
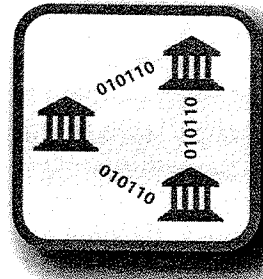
Link these repositories of digital culture together to create a global network of digital primary evidence that exists at the tips of the world's fingers. Make this distributed database scalable and inclusive to leverage the wisdom of the crowd, expose and share undiscovered cultural artifacts, and ensure the maximum chance of these artifacts surviving.

a. Help flesh out the idea for an Interarchive, discussed earlier.

b. Consider registering or integrating your own repository with Forging the Future's Metaserver or contributing to a union database of digital assets like OAISter[7] as a way of sharing your content and maximizing knowledge.

c. Consider allowing your own digital repository, or parts of it, to be cloned by others to maximize its chances of survival through redundancy and shared responsibility.

d. Make participation in this distributed database very easy, even for small institutions. Consider how an archive would participate if it had a staff of four, no dedicated IT specialist, and no funds for specialized tools. How would an individual artist or scholar participate directly?

e. Build this distributed database so that it uses widespread existing Internet tools and knowledge; it should be as easy to contribute to the database as it is to build a blog or a webpage. Consider the Open Library as an example.[8]

7. Lawyers: Help the Arts Find Progressive Approaches to Copyright
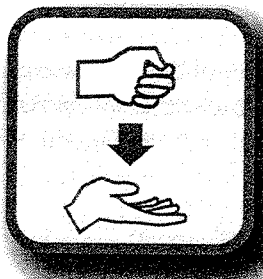
The Canadian Heritage Information Network commissioned a white paper, *Nailing Down Bits: Digital Art and Intellectual Property*, that reported findings on research and professional interviews related to digital art and the law.[9] This paper concluded with a research agenda that could serve as a useful starting point for others. In addition to opining, surveying, and

theorizing, *Nailing Down Bits* argued that we need to test how new media art and the law interact in the real world. When asked for advice on the best strategy to do this, staff of the Creative Commons answered that the arts community should build repositories of new media art in order to play through the legal issues (see numbers 1–6 above). Experimentation and precedent are more useful than preemptive guesses. Jump in. Some other steps might include:

a. Arts organizations that build repositories of new media art can partner with a law school program, professor, or legal clinic. The repository provides interesting new legal research opportunities for the students, while they provide much-needed legal analysis.

b. Artists working in new media are encouraged to consider the legal disposition of their artworks. Artists may consider licensing their work through Creative Commons or the Open Art License mentioned in chapters 7 and 10. Artists can also consider and then articulate in written guidelines who is allowed to remix their works now and who will be allowed to reinterpret and reconstitute them in the future. If you are an artist, don't wait for a collector to interview you. Just include your instructions with the artwork, wherever it goes.[10]

c. Institutions such as museums are often caught in the middle of copyright issues, between the artist/creator and the public/user. But institutions also originate valuable knowledge themselves, such as records, video and photographic documentation, and educational texts or scholarly essays. These institutions can release their own content through open licenses to maximize the benefit to the public.[11]

d. Law is often about interpretation; this is especially true in the arena of digital copyright, which lacks a long history of case law. Lacking precedent, courts may judge a case based on established community practice. That means that in an unclear case, defendants who are merely following the practice of their peers, in good faith, would be judged with more leniency. Since cultural community practice is still emerging, it would be of mutual benefit to establish liberal rather than restrictive common copyright practices. This means that whenever artists or museums make liberal copyright decisions, they help shield themselves and others in the future. This is illustrated in a recent Canadian Supreme Court decision which found that the consistent application of a written fair-dealing policy was *prima facie* evidence of the practice of fair dealing and that the burden of proof was placed upon the plaintiff publishers to dissuade the courts otherwise.[12]

8. Creators: Save in as Open a Format as Possible
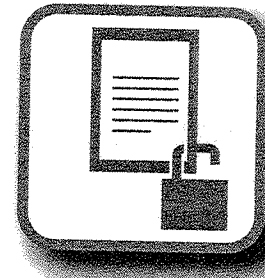
Protect your content. Back up your culture. Aim for long life if not immortality.

a. Whenever possible, save your work as uncompiled (ASCII) text or code. If you must use compiled code, save the original source file as well as the compiled one.

b. Be selective in what you preserve. You are most likely to preserve what you have a good reason to look at again.

c. Back up in multiple locations, both local and online.

d. Post/back up your work to open archives (Internet Archive) rather than proprietary ones (YouTube).

e. Avoid compression if possible.

f. Avoid proprietary formats, especially ones with any form of digital rights management, in favor of free and open standards. (Our best guesses on format longevity appear in table 13.1.)

9. Dealers: Invent New Economic Models
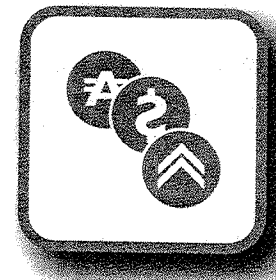
Research, model, and test how new media art interacts with the art market and other economic environments. Due to the legal, social, and technical complexities that attend new media art, collectors are sometimes understandably hesitant to buy this work. That forces new media artists to experiment with alternate economic models, but it also removes a time-tested source of support for individual new media artists and indeed for a whole genre of creators. Some brave models exist. For instance, the Catherine Clark Gallery in San Francisco and the Bitforms Gallery in New York have successfully sold new media art and have developed methods for continuing to do so. Caitlin Jones pioneered the use of variable media questionnaires in new media acquisitions for the Bryce Wolkowitz gallery.

a. Gallerists and private collectors need to be part of the conversation around preserving new media art. Private collecting not only provides one form of tangible support for artists, it also constitutes an additional sphere

Table 13.1

Comparative Longevity of Various Formats as of 2013

Format	Short-term	Medium-term	Long-term	Indefinite future
Text file	MS Word (.doc)	PDF,[1] Open Document Format (.odt), Office Open XML (.docx)[2]	TXT, HTML, RTF (Rich Text Format)	Nothing
Web application	Flash, Director (Shockwave)	Java	HTML, CSS, JavaScript	Nothing
Database	Filemaker, Access, Oracle	MySQL, PostGresQL, NoSQL	XML (Extensible Markup Language), RDML (Relational Database Markup Language)	Nothing
Server script	A.I.R, .NET/C#	Java (servlets), Ruby	PHP, JavaScript, Python	Nothing
Spreadsheet	Excel (.xls)	Open Document Format (.ods), Office Open XML (.xlsx)[3]	Comma-separated values (.csv)	Nothing
Vector image	Illustrator (.ai), Flash (.swf)	PDF,[1] CGM (Computer Graphic Metafile)	SVG (Scalable Vector Graphics), EPS (Encapsulated Postscript)	Nothing
Raster image	Photoshop (.psd), GIF	JPEG	Bitmap, TIFF, PNG, JPEG 2000	Nothing
Audio file	Copy-protected CD	Windows Media Audio, MP3, AAC	Ogg Vorbis,[4] FLAC, PCM (Pulse Code Modulation), DTS-HD, WAV	Nothing
Video file	Copy-protected DVD, BluRay	QuickTime (.mov), Windows Media Video, MPEG4,[5] AVI	Ogg Theora,[4] WebM/VP9, Motion JPEG 2000, MXF (Material Exchange Format) JPEG 2000[6]	Nothing

Note: A chart like this is more weather forecast than scientific measurement, and we're printing it not to serve as a tablet of biblical commandments but to illustrate how lifespan increases when formats are free, open, and uncompressed. We're grateful to John Bell and Richard Hollinger of the University of Maine Digital Curation program for our running debate about file formats, which has shaped the opinions expressed in this chart.

Table 13.1

(continued)

[1] As of this writing, I (Jon) don't believe PDF will have the longevity that many preservationists ascribe to it. Although released as an open standard in 2008 (PDF/A being a format designed for archives), PDF has had a troubled history of capturing interactivity (leading to JavaScript vulnerabilities) and still presents no easy way to access or modify the source code that determines its formatting.

[2] As of this writing, there is controversy over which of these two "open" formats is most open or will endure longest.

[3] Ditto.

[4] The Ogg Vorbis and Ogg Theora formats have the benefit of being open standards, unencumbered by patents or copyright. As of this writing, however, more widely adopted standards like MPEG-4/H.264 and WebM/VP9 have begun to shed their intellectual property restrictions as well. Having pressured proprietary formats to become more open, the Oggs may have served a purpose John Bell describes as "more political than technological." John Bell, private correspondence with Jon Ippolito, October 27, 2013.

[5] Despite the patents that hang over it, MPEG-4 is as of this writing one of the most popular cross-platform, Web-friendly video formats, especially when compressed with the H.264 codec. In 2013 Cisco agreed to open-source the H.264 spec and pay related patent costs; unfortunately that doesn't make the codec free—just out on bail.

[6] Motion JPEG 2000 and MXF JPEG 2000 both permit lossless capture of individual frames and no compression from one to the next, which relieves future preservators from having to reconstruct those layers of software. Another example of an uncompressed video format was applied to the emulation of *The Erl King*, as described in chapter 8. See note 23 of that chapter.

Frame-based film preservation has an impressive pedigree. In a rare example of the law contributing to the longevity of an art form, copyright law before 1912 required creators to deposit paper copies of their work with Library of Congress, and for pioneering filmmakers there was little alternative but to develop contact prints of their movies frame-by-frame. Now that much of the original film stock has deteriorated, these paper sequences are the only extant record of the original films. "The Paper Print Film Collection at the Library of Congress," *Library of Congress*, http://memory.loc.gov/ammem/edhtml/edppr.html, accessed November 12, 2013.

Ironically, this "preservation via copyright" has also spurred examples of proliferative preservation, as in Ken Jacobs's *tom tom the piper's son* (1962), which he created by reshooting paper copies of a vintage film and reanimating it frame by frame:

Ken Jacobs's avant-garde landmark . . . begins with a 1905 short of the same title, in which a large crowd of people tumble through a doorway, leap from a loft, and climb out of a chimney

Table 13.1
(continued)

in pursuit of the eponymous pig thief. Jacobs then rephotographs the film—slowing it down, freezing frames, introducing flicker effects, and isolating portions of the frame, some so tiny that we see mostly the grain. As he varies the rhythm the film becomes a series of carefully constructed riffs on particular characters or actions, or on pure shape; new meanings emerge from the little dramas between alternating shadows, or from background elements of the original. . . . Thus Jacobs teaches us how to resee almost any film, by mentally reframing its images or changing the speed of its action.

Fred Camper, "Tom, Tom, the Piper's Son," *The Chicago Reader*, http://www.chicago reader.com/chicago/tom-tom-the-pipers-son/Film?oid=1049974, accessed November 12, 2013.

for preservation. We can come together in professional forums and individual partnerships to develop equitable models for how private collecting can coexist with public service and even open-source practices. (For example, no more self-destructing DVDs.)

b. Limiting the edition for a duplicable work to three or five instances may help you jack up its price, but remember how poorly digital rights management has served the entertainment industry. You're more nimble than Sony or Time Warner—invent a creative financing scheme that doesn't restrict future access to the work. Otherwise, artificial scarcity in the short term will lead to innate scarcity in the long term.

c. For their part, creators should continue to explore additional economic models such as art subscriptions. Some models can succeed independently of the art market; artists like Scott Snibbe have sold inexpensive works in high volume for mobile devices through commercial music and software channels.[13]

10. Sponsors: Fund the Preservation of Born-Digital Culture
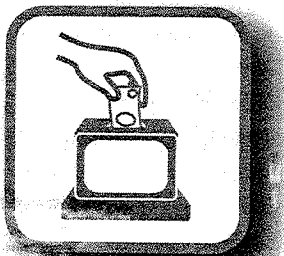
The NEA, NEH, and others have generously funded projects, including many of those mentioned in this book. Still, much funding continues to be devoted to building giant online databases of scanned paper documents and pictures of paintings. These are invaluable for research, but while we're researching our past using new media, our contemporary culture, created using those same media, lies dying. How much of the original $99 million dollar

Congressional allocation for the preservation of digital culture (NDIPP) is going toward the problem of preserving digital art, or any born-digital culture for that matter?

a. Large funders like foundations and government agencies could create programs, no matter how small to begin with, that deal with the preservation of born-digital material.

b. Funders could help everyone by funding risk and new approaches. It's safer of course to fund time-honored methods, but, as this book has tried to make clear, if we continue our old practices, our new culture is doomed. Again, even failure can produce new knowledge.

c. Not just large funders but small ones on the level of individual galleries, museums, and sponsors can help as well. When you next commission a work of new media art, consider how your investment will serve the public in the long term as well as for the short-term exhibition or program. You might consider incorporating elements into your agreements that stipulate that the commission be available for remix, if only on a local level. (The V2_ organization in Rotterdam included a requirement that work produced in their lab on one of their fellowships be kept in the lab and made available to future fellowship artists for remix.) A university museum could require a similar stipulation that served just their campus (if not the world). It's a start.

11. Academics: Educate, Engage, Debate
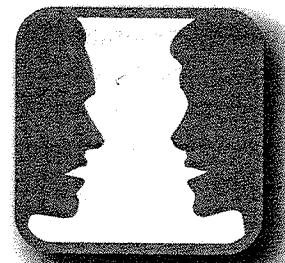
This book is one small attempt to further our shared conversation around new media, preservation, and social memory. We need many more.

a. If you are at a university, consider sponsoring a program or department like NYU's innovative Moving Image Archiving and Preservation Program, Avignon's Laboratoire des Médias Variables,[14] or the Digital Curation online program at the University of Maine.[15] There aren't enough around, and it's a chance to claim a niche while serving a need.

b. We need programs like the one above, but which focus on or include a significant component oriented specifically at new media art.

c. If you are at a museum, train your next preservator with a fellowship like the Guggenheim's Variable Media Fellowship. Or consider a public forum on the topic, like the Berkeley Art Museum's "New Media and Social

Memory" conference. Use this as an opportunity to engage with private collectors or law schools, as mentioned above.

d. In addition to individual schools and universities, larger umbrella organizations such as the American Alliance of Museums, the Museum Computer Network, and College Art Association can serve as clearinghouses for information and professional development around new media preservation.

e. Beyond the world of art and museums, create new conversations and new partnerships with others who also struggle with new media preservation: government agencies, libraries, industry, and entertainment.

12. Historians: Challenge Conventional Wisdom about Social Memory

As we said at the beginning of this book, new media have created a crisis in remembering that provides both an impetus and an opportunity to revisit the models and practices of social memory. This crisis is not limited to the art world. We need to foster and reward research on the theoretical, artistic, and social implications of the interplay of new media and social memory. We cannot significantly alter entrenched institutional practices without tackling the historical attitudes and discourse behind them, so both the practical and the theoretical are important here. Review the museological model for preservation. Put people—creators and collectors of artifacts—at the center. Question the current configuration of institutions (do the three primary types of cultural heritage institutions—museums, libraries, archives—remain the primary types we need today?).[16] Don't fall back on old-school art museum/media preservation discourse—come up with new paradigms so we can see what we're dealing with and make the necessary changes.

Conclusion

This book has argued that new media's challenges to time-tested practices can inspire us to reexamine and improve the ways social memory serves contemporary and future societies. We've tried to show that digital media impact both the subject and the tools of archival practice. The proliferative potential of these new media also suggest that social memory may be served by a reintegration of both formal and informal practices. Museums can, for instance, learn from indigenous cultures how to preserve living culture.

Digital media further confound the preservation, and even the concept, of the "original" in artistic, legal, and technical senses. This may not be a problem; maybe we are finished with notions of master copies and masterpieces. It is clear that in the not so distant future, when curators exhibit works of new media art, it will not be the familiar case of bringing the painting up out of the basement fully intact, looking just as it did 400 years ago, oozing authorial intent and integrity. Rather, new media works are going to need to be managed and migrated on a continual basis, and any future presentation will be, to some extent, an act of reinterpretation, reperformance, and remix.

In *Collecting the New*, Howard Fox wrote: "Anticipation of the future, rather than codification of the past, is a necessary attribute of the contemporary curator's function."[17] Curators and archivists must be able to dust themselves off and become futurists and reenactors. They must be able to describe the behaviors of an artwork with the same rigor, authority, and even linguistic specificity that they now use to describe its form. If they are to remain relevant, especially in collecting and preserving our digital culture, cultural heritage institutions like museums may need to become expert at embracing and managing change in addition to fixity. Cultural heritage institutions are themselves not locked into a fixed form but, like new media art, they need to be periodically reinvented. Perhaps the cultural heritage institutions that succeed in preserving our digital heritage will not look like entomology cases, where the butterflies of culture are pinned to the walls, fixed and motionless in their one true form for eternity. Instead, they may look like butterfly huts at the zoo, where they will breed successive generations of living culture that float about, flutter, and delight us.

Of course, in the fifty- to hundred-year view, calamities like climate change, energy descent, and economic collapse may make challenges like digital rights management and delamination seem like a walk in the park. Some say art can survive such cataclysms if we dump enough of it in a climate-controlled vault, along the lines of the great seed bank being built in Norway.[18] But here again the impulse to centralize does not necessarily serve the cause of preservation, as global disasters are more of a threat to capital-intensive systems such as governments, banks, and museums than to a dispersed populace of eccentrics making art in trailers and garrets. Perhaps the best way for art to survive the end of civilization is to go back to precivilized ways of preserving it.[19] The preservationists of the post-apocalypse won't wear white gloves. They'll be unreliable archivists—and that will be OK.