CAN MUSEUMS COLLECT NEW MEDIA ART?:
THE NEED FOR A PARADIGM SHIFT IN MUSEUM CONSERVATION

by

Jessica I. Hodin

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Fig. 1. Sep Kamvar and Jonathan Harris, *I Want You To Want Me*, 2007, computer program and 56” high-resolution touch screen, Museum of Modern Art

Fig. 2. Mark Napier, *Net.flag*, 2002, Internet Art, Guggenheim Museum.

Fig. 3. Sol LeWitt, *Wall Drawing #1152 Whirls and Twirls*, 2005, Acrylic Paint, Massachusetts Museum of Contemporary Art.
Chapter 1: Introduction – The Value of Collecting and Conserving New Media Art

One of the most distinctive features of fine art as a commodity is its propensity for being collected; and while the inherent value of a work of art is derived from its materials and the artist’s labor, a substantial portion of the value of art is acquired through its association with certain collections. Museums, as collecting institutions, validate culture and taste, and are essential to conferring value onto works of art. This valuation system is deep-rooted in the framework of the museum institution; Historically, the objects preserved throughout the evolution of our culture are more valuable to us and to future generations. The art market relies on museums to continue to be one of the cultural bodies that endorses works of art and legitimates the range of monetary value for art. From an art market perspective then, museums will become even more influential as the market retreats into a recession. The art market can be unstable and based in reputation or trend, but the museum collection is more long-term in its valuation and adds a more concrete character to the valuation process. In other words, the art world is unique in its dependence on scholarly aspects to underpin its commercial transactions. It is for these reasons that museum collections are essential to the integrity and robustness of the art market, and will be vital for establishing a reputation for contemporary new media artworks, a genre that is in the process of developing an art historical narrative and a value structure.

Conservation, preservation, and documentation are tantamount to collecting, which is the primary tool of valuation within the art market. Within
the current institutional model, if works cannot be maintained, they are unlikely to be collected, and moreover, if works are not collected, they are not exhibited and conserved and will likely lose their value and importance to society. The problem herein is that the innovative qualities of new media art forms and their integration of technology make them increasingly difficult to preserve. Ephemeral, digital, time-based, live, or variable works of art, present conceptual and technical challenges that create barriers to their conservation and, therefore, collection. These specific challenges presented by new media will be discussed and examined in this thesis and I will seek to determine how museums should best conserve new art forms that lie outside the traditional institutional and market structure.

The problem runs deeper: If the museum is the institutional framework for validating and defining art, and if museums only collect works they can conserve, then, on a basic philosophical level, an artwork’s ability to be conserved is what defines it as art. “Since the Eighteenth Century the traditional view of the art museum has been that it is an institution intended to preserve and display works that have withstood the test of time. Given the fallibility of aesthetic judgment, this has seemed the most reliable way to identify artistic quality.”¹ As a result of the increasingly liberal orientation of the art world, the definitions of art have broadened so that contemporary artworks embrace technological, alternative, and ephemeral media, appropriated from other realms of our society. These new media are problematic to conserve and challenge the very institutional framework

of art because they do not fit the traditional model of collection, validation, conservation, and value structure that the art world has designed.

The traditional conservation paradigm worked for the biases of the static media wherein the built-in assumption is that paintings, sculptures, etc. are cared for chemically, carefully restored, kept in the appropriate climate, and their artist/origin and context is documented. In the Twenty-first century, this framework must expand to include new media art. So much of today’s art is variable and cannot be contained the same way as static media. Many museums have, thus far, acted ambivalently toward new media art, trying to fit it into the existing paradigm, not adapting their conservational models to accommodate the new media. Most of the progress in preservation tactics has been done at an independent level or within a few progressive museum institutions. Museums cannot shy away from validating these new art forms because of the difficulties associated with their conservation or they risk becoming irrelevant institutions. If these works are to be validated or remembered, museums must evolve the way they collect and conserve to develop a new paradigm that meets the needs of new media art.

It is important to consider the political, ethical, and conceptual constraints of the conservation paradigm as it exists now and also as conservators wish for it to continue.

Museums are important to society because they preserve culture. New Media Conservator at New York’s Museum of Modern Art, Glenn Wharton, says,
“preservation is the most fundamental of [a museum’s] responsibilities, since without it research and presentation are impossible and collection is pointless.”2 Museums conserve works to ensure they are around for the education and enjoyment of future generations. The implications of the next phase in the development of contemporary preservation will be crucial to determining the fate of new media art, its value to society, and value within an art historical narrative. “In tech art, the issue of maintenance is a true disaster. If a high-tech artwork is not to be a mere passing sideshow, then some curator must acquire it and maintain it, and the work must outlast the lifetime of its technical-support infrastructure.”3

In an increasingly strong effort to effect transparency, museums’ policies and guidelines indicate their commitment to cultural stewardship. The museum’s preservation of the works in its collection is vital to its mission statement because, practically, this role is the basis for receiving funding, and ethically, it fulfills an obligation to care for cultural heritage. Proper maintenance and care for collections are significant requirements of belonging to the Accreditation Commission of the American Association of Museums (see Appendix A). The AAM has official documents for best practice guidelines and standards in such irregular areas as Nazi era art or museums facing downsizing; however, while there are specific expectations and ethics regarding collections management, there are no guidelines or suggestions on how museums can actually maintain a new media or variable and live media collection. The International Council of


Museums’ code of ethics online states in section 2.24 *Collection Conservation and Restoration*, “The principal goal [of conservation/restoration] should be the stabilisation of the object or specimen….”\(^4\) A goal of stabilization is insufficient and unethical for variable art, or time-based art, the essence of which is its variability. Wharton explains, “Two such values that come into conflict with the aims of contemporary art are the ‘preservation ethic’ and respect for the ‘true nature’ of the object”\(^5\) because in attempting traditional preservation goals, the true (i.e. variable) nature of the artwork is denied. Although conservators in museums work under the ethical and professional standards determined by these governing associations, they fall short as doctrines when it comes to dealing with new media and fail to address the concerns of Internet, digital, time-based, and variable artworks.

To stay relevant in this changing art climate, museums must respond to the medium and reinvent the paradigm of conservation. It should not be materially based, rather it is about creating metadata, actively interviewing the artists and maintaining an accessible archive of all relevant documentation, to be able to preserve the intent of the piece, and accepting that recreation is an inherent quality in new media. The contemporary collection must take an active role in its preservation because new media relies on software and hardware that become outdated very quickly, requiring conservators to continually update data storage

\(^4\) Icom code of ethics online. http://icom.museum/ethics.html
and playback devices, regardless of whether or not the artwork is still in working order.

The collection of contemporary works has always been controversial, in part because it conflicts with the traditional notion of the art museum as an institution that preserves works that have withstood the test of time. “The validation that artists and contemporary collectors seek from the display of their works in museums is based on the association of the museum with the time-tested masterpiece, a normative connection grounded in a convergence of historical opinion that seems to rule out the new.”6 The art community has always questioned the ethics of giving these pieces immediate validation by including them in prestigious public collections. Consequently, some modern and contemporary museums were established under anti-collection policies. The Museum of Modern Art was first established with the hopes of holding art for forty years and then selling and replacing with newer art. While this was a radical and progressive policy, most museums, including MoMA, quickly changed their thinking when they realized that part of their mission was to retain these works to offer future generations the ability to view expressions of times past. As contemporary “collecting institutions embraced the established model of holding and preserving works in perpetuity”7 they took on the responsibilities of long-term preservation of these artworks.

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7 Ibid, 7.
New media challenges the premise of the need to preserve because much of this art is not intended to be collected, but rather made by the artist as a way to subvert the traditional gallery and museum institutions. The New Museum still maintains the “semi-permanent collection” model\(^8\) because by hosting but not collecting works of art they are acknowledging the biases of the new media, the intentions of the artists to employ an ephemeral medium, and calling attention to the idea of transience. There is a third party who disagree and argue that this new type of art, which resists being collected or shown in the white cube space, can in fact be validated by the network of users who participate in the work or who purchase the software art. This view represents another shift in the art world, that the museum may no longer be necessary.

This thesis supports the idea that it is precisely in this new world of anti-museum art that there is a need for the institution and the stability it provides. New media’s resistance to collection is counterintuitive to the art market and to the museum model, but the art world must adapt and confront the biases of new media. Within the new media literature there is an open hostility to museums as the great neutralizers, ripping the objects out of their contexts and thereby watering down the art’s effectiveness. The Liberal viewpoint of the paradox of collecting known as “protective destruction” touts “the transplantation of a concrete individual piece into a collection means that this piece partly or

\(^{8}\)“According to its 1978 collecting policy, the New Museum would seek to acquire at least one work from each of its major exhibitions, and each of these pieces was to be retained for at least ten years and no more than twenty. Works that entered the collection outside the exhibition program, whether purchased or donated, must have been created within the previous ten years and would be deaccessioned within ten years of acquisition.” Brian Goldfarb, “Fleeting Possessions,” Temporarily Possessed, ed Brian Goldfarb (New York: The New Museum of Contemporary Art, 1995).
completely perishes in favor of its documentation.”9 Meanwhile, “some art only comes into being by virtue of it being collected.”10 Without funded preservation efforts, all of this immaterial, variable, conceptual, performative, and networked art would be lost in time. Reciprocally, seeing as “unstable works can accumulate monetary or social value, leading to conservation interventions that challenge ethical practice but are sometimes justifiable,”11 the museum should be forced to find ways of conserving that do not compromise artistic intentions.

Bruce Altshuler, Director of Museum Studies at NYU, pinpoints the institutional policy flaw that while there is a desire to collect new media, there is also a reluctance to adapt museum conservation policies because it can be expensive, inefficient due to technology changes at such a fast pace, and involves more tech-oriented skills than the typical museum employee usually possesses. Ironically, the reluctance to challenge the traditional art historical system of museum as a validating authority “generally has existed alongside a fervent desire to embrace the new.”12 It seems that if the museums were to continuously update their approaches and institutional policies to accommodate the collection and conservation of new media artworks, both camps could be satisfied. This paradigm shift has already begun slowly in some institutions, with full force in groundbreaking institutions, but not at all in most.

10 Ibid, 28.
“Institutional structures created at an earlier time to meet different needs are being called into question by new artistic media and by the use of the term *contemporary* to designate a particular kind of artwork. Alternative concepts of the artwork and new technologies have created special problems of preservation and conservation.”¹³ Digital, time-based, Internet, and variable media art are thriving practices, but problematic to collect because they cannot be contained the same way as traditional media. In order for the new media works to be culturally significant and possess monetary value, according to the art world’s structure, the museum paradigm of conservation will have to adapt to meet the evolving demands of the art world.

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¹³ Ibid, 8.
Chapter 2: New Media Art

It is crucial to first define “new media” and identify the type of art that will be the focus of this dissertation. By outlining the trajectory of Twentieth-century new media, I hope to provide context for the current conditions facing museums that collect digital-born, Internet, variable, and time-based media and identify the difficulties of this art’s conservation.

“New media” is an “evolving reference”14: At each turn in history, the art that utilized the most advanced technologies available was considered “new media”; Therefore the plight of new media is that its definition changes as newer media is invented. As new materials and modes of production become available to artists, they have generally either responded by incorporating them into contemporary avant-garde art practices, or reacted by disregarding them and sticking with traditional methods and materials. Additionally, as certain concepts become important to artists, they seek out new materials and modes of production to comment on these concepts in their art. This dissertation deals with these conceptual issues in so far as their effect on the conservation of digital-born, Internet, variable, and time-based art. But these art forms incorporate the history both of the technological innovations of our century and of the evolving conceptual goals of its artists. Older versions of new media, Performance, Installation, and Dada, may not have utilized computer technology, but were performative, variable, process based, or conceptually based, and as such posed different issues to conservation than did static media.

One overall trend of this century is increased viewer participation in the work of art, enabled by modern technology and fresh creative practices. The inherent quality of an interactive work is that it is variable; its output is produced by varying input, thus complicating what constitutes the work of art and which elements of the work to preserve. Museums must be equipped to interface the viewer and the work of art.

Another trend of the art of this century that has presented a predicament for conservation is a greater emphasis on the ideas of time and the ephemeral, in regards to materials and duration of an artwork.

The technological revolution of the Twentieth Century set the stage for avant-garde art as artists took advantage of the ability for technology to incorporate and explore the element of time in their artworks. The history of technology in art is still being written; no linear narrative exists yet, although many scholars start with photography as the beginning of technology in art. Theorist Walter Benjamin identified the history of technology in art by tracing mechanical reproduction because he said it “represents something new.”¹⁵ He described the historical precedents of mechanical reproduction from the stamping and founding techniques of the Greeks, to the woodcut, etching, printing press, through to lithography and photography.¹⁶ This marriage of art and technology

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continues to be the force that produces “new media” art and also drives the progress of related industries such as archival systems and conservation.

The Industrial Revolution ushered technology into every day life. Kodak film became available to the public in 1883, and when the Kodak camera was made easily operable and portable in 1888, photography became more expressive and less documentary. By the 1890s avant-garde cinema emerged as an art form. With these technologies, artists could comment on the notion of time in different and more effective ways. From the early photographic studies of time by Muybridge, to the French philosopher Henri Bergson’s studies of time\(^{17}\), artists were inspired to explore this concept because of the ability to capture real movement.\(^{18}\) “Art and technology, as represented by still photography and cinema, were becoming forever entwined as the thematic dichotomy between art and life gradually dissolved in the face of ubiquitous machines.”\(^{19}\)

World War I brought on anti-establishment art forms like Dada whose premise was rooted in the anti-war movement and whose practitioners expressed themselves through actions and demonstrations. The use of unconventional materials in installation and re-appropriation made Dada the “new media” of the 1920s. Dada and its spawn Fluxus, whose progenitors believed that the viewer completes the work of art, were against the loftiness of the museum collection; as a protest against capitalist bourgeois society, the museum collection was the last place the Dadaists wanted their art. Dadaists’ use of a new medium, the everyday object, and a new approach, installation, introduced the ephemeral into the art

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\(^{19}\) Rush, *New Media in Art*, 20.
exhibition. Museums, who collected this art, regardless of the intention for it not to be collected, were challenged to preserve these elaborate amalgamations of found objects.

In the next generation, abstract expressionists emphasized the gestural application of paint on canvas, and performance artists used their bodies as works of art. The abstract expressionists were not unique or new in their medium, (most used paint on canvas), however, they were innovative in their emphasis on process and concept over representation and finished product, and as such, paved the way for conceptual art. “In the iconoclastic spirit of the 1960s, [Vito] Acconci and others sought to free themselves from the influence of art history by eliminating all but the process from their work.”20 “Critic Clement Greenberg’s dictum that the meaning of art was to be found within the object itself was being challenged now by the notion that central to the practice of art was concept and context.”21

Conceptual and performative artworks posed huge challenges to museum collections and to gallerists in marketing and selling these works. The palpable, conservable, and salable material is reduced to documentation of the performances or instructions on how to reproduce them, as in the case of Sol LeWitt (1928 - 2007) whose performances were sold and archived as sets of instructions and rights for reproduction. “America is the place where conceptualism first turned documentation into a new art form.”22

20 Ibid, 48.
21 Ibid, 82.
22 Schaffner and Winzen, Deep Storage: Collecting, Storing, and Archiving in Art, 10.
In The Sixties video art emerged as a result of the new technology dominant in peoples lives, a situation similar to the birth of photography as an art form earlier in the century. Video art was a natural step because “in order to have a critical relationship with a televisual society, you must primarily participate televisually.”23 In The Seventies, as a further exploration of time and electronics, artists created video installations with multiple channels and monitors and live feeds. As other types of electronics were soon incorporated into the arts, the neon signs of Ed Ruscha, the fluorescent lights of Dan Flavin, and the viewer-operated mechanical apparatuses of Rafael Lozano-Hemmer, installation art and electronic art gained a wider definition. “As the technical capabilities of media have expanded, the integration of different elements (sound, image, sculptural setting) … has become more widely practiced.”24

The application of technology to installation and performance and the introduction of live elements or reliance on audience participation “enhances the exploration of time.”25 “‘Time emerged not only as a recurrent theme but also as a constituent parameter of the very nature of an art work.’ (Curator Anne-Marie Duguet) With the emergence of performances, events, Happenings, installations, then videos, the temporality of the art form was central.”26 In exploring the theme of time, artists were fabricating experiences, which presented a paradox to the conventional values and goals of conservation to keep artworks stable. Not only were conservators challenged to conserve the electronic equipment and content of

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21 Rush, *New Media in Art*, 82.
24 Ibid, 161.
25 Ibid, 125.
26 Ibid, 12.
the installations but also to conserve the instability of the art. The platforms and configurations had to be documented and the conservation industry was suddenly asked to make judgment calls on whether to preserve the audience interaction and live, participatory content. Throughout the progression of Twentieth-century art, as time became bound up in the content and intent of the art, conservation grew ever more complex and sometimes impossible. “Artists began to flow around the obstacle of the museum, constructing a practice independent of the traditional art world – a new practice that relied on social and technological networks.”

The invention of the computer enabled artists to use digital processes like digital photography, video (i.e. digital film), and “to control and coordinate effects of movement and light.” But Digital-born art is even more advanced, defined as computer-generated images. New media expert Steve Dietz explains, “Output that is homologous to the input is not new-media art. For example, to digitize a photograph of a painting and post it on the Internet is not new-media art…because it simply and faithfully re-presents the source material without any aesthetic intentionality.”

The original digital artists were actually computer scientists. Michael Noll was working at Bell Laboratories’ telephone transmissions when he discovered the aesthetic qualities of the images he was producing on the computer. "As the

27 Sara Diamond “Participation, Flow, Redistribution of Authorship” New Media in the White Cube and Beyond, ed Christiane Paul (Berkeley: University of California, 2008), 144.
30 Rush, New Media in Art, 205.
programmer…Noll insisted that the true work of art was the generating program rather than the computer-generated object.”\textsuperscript{31} This concept later developed into software art.

Digital media as a technological process is recursive: “Any output can become input, and in regard to network-specific art, or net art, the Internet can constitute the input and/or output of an artwork…”\textsuperscript{32} The variable nature of digital and Internet art and its reliance on external input is a potential hazard for conservation because the input may be unstable, copyrighted, or incompatible.\textsuperscript{33} Artists realized that, using this technology, they could create dynamic, interactive systems that can be modified, manipulated, and even undone, and they were enabled to further engage the idea of time through variable and interactive art.

Multimedia curator Cynthia Goodman says,

\begin{quote}
The interactive abilities of computer systems hold the key to radical changes within the artmaking process…Through electronic implementation, sculptures and environments can be activated to follow programmed patterns of movement or even respond to external stimuli…Once an artist establishes certain boundaries, the interactive behavior of a piece is limited only by the inventiveness of the spectator.\textsuperscript{34}
\end{quote}

The salient feature of digital art is its lack of existence without a platform. Digital art has no referent in a non-digital, three-dimensional world because the art is the code produced by the computer programmer. “A lot of new-media art, especially network-based work, doesn’t have spatial dimensions per se, but nodes

\textsuperscript{31} Goodman, \textit{Digital Visions}, 24-25.
\textsuperscript{32} Dietz, “Curating Net Art,” in \textit{New Media in the White Cube and Beyond}, 87.
\textsuperscript{33} Steve Dietz, “Collecting New Media Art: Just Like Anything Else, Only Different,” in \textit{Collecting the New: Museums and Contemporary Art}, 90.
\textsuperscript{34} Goodman, \textit{Digital Visions}, 11.
and levels of connection.”

The computer facilitates an interactive art form “radically interdependent in its incorporation of ‘the viewer’ into the completion of the art.” Thus, new media includes networked pieces that are more performative than object-based, recalling the avant-garde art forms of the past.

The ultimate example of new media’s influence on the relationship between the viewer and the artwork occurs in cybernetically created “responsive environments,” a term coined by computer scientist Myron Krueger, for sophisticated computer programmed installations, which perceive and interpret human behavior and respond through intelligent visual and auditory displays. The art form is the composed interaction between human and machine, the experience of the viewer, mediated by the artist.

The dimensions of space and time figure prominently in the art of the Twentieth Century as artists emphasize performance, process, and interaction over tangible objects. Artists’ exploration of electronic technology and computer science enabled innovative creative practices and the ability for artists to build this dialogue on process, interaction, and time in ways they never thought possible. “In art, visual literacy is no longer limited to ‘the object.'”

Ironically, even though much of this art bears the anti-museum attitude characteristic of earlier artistic movements like Dada and Performance, museums are the

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35 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 89.
36 Rush, New Media in Art, 183.
37 Goodman, Digital Visions, 132.
38 Rush, New Media in Art, 183.
institutions that must keep this art alive in memory and in as complete a form as possible. 39

As a result of the continuous eagerness to incorporate materials and technologies not usually found in the arts, the meaning of “new media” has been in a constant state of evolution. Dietz defines new media as “works that use computation as more than just a production tool and/or use the Internet as more than merely a means of delivery,” 40 indicating his preference for process to be the determining factor. New media is now referred to with labels like time-based, digital-born, tech-art, or web-art. “None of the terms are satisfactory in my mind,” says Wharton. “We are in the middle of a moment when technology is being produced is so quickly that it is acceptable that the definition of new media keeps changing.” 41

39 Ibid, 124.
40 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 86.
41 Glenn Wharton (Conservator New Media, Museum of Modern Art, New York), interview by Jessica Hodin, June 2009.
Chapter 3: Art Conservation

Traditional art conservation addresses the needs of works of fine art, such as paintings, sculptures, and drawings that are generally tangible, fixed objects and intended to have a stable material composition. Trained conservators use chemistry and science to fix cracking paint, broken sculptures, or faded drawings, and preventative measures such as keeping galleries at specific temperatures and humidity levels in order to maximize the lifetime of the artworks.

New media art profoundly changed the technological, conceptual, and practical demands on conservation. While the means of traditional conservation and restoration are generally directed at the physical construction of the work, the conservation of new media demands that conservators attempt to preserve the concept and intentions of the work and proactively create documentation. If conservators’ and restorers’ goals are to keep the art object as close to its original meaning and message as possible, it is crucial to understand the work, the intentions of the artist, and the art historical context that it evokes. Jeremy Strick, Director of the Museum of Contemporary Art Los Angeles, explains why the collection of this type of contemporary art causes such a profound shift in museum structure: “[New-media art] questions everything, the most fundamental assumptions: what is a work? How do you collect? What is preservation? What is ownership? All of those things that museums are based upon and structured upon are pretty much thrown open to question.”

Conservation is continually challenged to grow as an industry in response to artists’ use of new materials and increased emphasis on concept and process.

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42 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 85.
Contemporary artists have picked up on new technologies so quickly, in fact, sometimes it is the artists who create the new technologies, making it difficult for the conservation field to keep pace.

Early on, video and film posed different challenges for conservators due to their unconventional and technologically based material composition and reliance on playback devices. Film is an analog medium made of a fragile cellulose nitrate film stock susceptible to mold, expansion, contraction, and capable of spontaneous combustion. To ensure its survival, film is stored in special canisters and at specific temperatures. Video is made of a magnetic strip that has a tendency to stretch and break and deteriorate over a period as short as thirty years. The controlled storage requirements and fragility of the physical materials of video and film resemble the same model of conservation as that of traditional older media. However, the long-term viability of film and video is tied to deeper issues like technology obsolescence. “These media are subject to deterioration just as more traditional ones are; their situation is more complex, however, because they can only be viewed by means of machinery that is itself subject to the vicissitudes of time.”

Film and video works significantly impacted conservation because the new materials and technologies demanded new skills and because collections were forced to approach a solution by stockpiling outdated hardware. Most importantly, conservators had to understand the essence of the artworks so that

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when the physical form is compromised, intangible, or ephemeral, they will be capable of putting together enough information to recreate the work as closely to the artists original intentions as possible. The main concern on “how to conserve the constituent materials of the objects and therefore their physical integrity” was “soon considered too narrow and it became evident that other non-technical issues had to be taken into account.”

Computers have brought an entirely new set of issues and demanded new skills from conservators as well as a different approach to conservation. When the technology became available in the 1980s, there was a “rush to digitize” the film and video as a way to preserve content and prevent, or even eliminate, the physical deterioration of their precarious materials. While digitizing film and video diminishes the physical hazards of their media and allows institutions to minimize physical storage space, digital files are not exempt from the same problems as their precursors; Digital files need specific software and hardware to be viewed and must be upgraded as technology changes. “Most digital documents and artifacts exist only in encoded form, requiring specific software to bring their bit streams to life and make them truly usable.” Digitizing also changes the medium such that the intricacies of the old film and video are lost. “If we moved the [16mm] work to DVD we would have to consider, among other things, the curious question of whether we should try to reproduce the characteristic clicking sound of the little home projector, as that was part of the

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original experience of the artwork.” In addition, “the physical lifetimes of
digital storage media are often surprisingly short, requiring information to be
‘refreshed’ by copying it onto new media with disturbing frequency” and each
attempt to copy “substantially degrades the quality of the images.” The drastic
changes in their format and the inability to view them on the hardware for which
they were intended means they are not the original works of the artists but rather
documentations of the works. Digital documents created with proprietary
software produce additional complications since they become susceptible to the
computer technology industry and market. Digitizing, while useful in some ways,
actually increases a work’s instability because it is one degree removed from its
original state and replaced by digital documentation that is also unstable in its
own ways.

Many digital-born, variable media artworks “are ultimately ‘enabled’ by
audience input.” When an institution collects live pieces that rely on
contributions from the public or real-time Internet feeds, the curators and
conservators have a responsibility to support the interface platform and archive its
operations along with the work of art. Continual maintenance of these works and
their technologies is a new job of conservators. It also requires the acceptance
that an artwork will change and that containing the work in an institution does not

47 Rothenberg, “Avoiding Technological Quicksand: Finding a Viable Technical Foundation for
Digital Preservation.”
49 Paul, New Media in the White Cube and Beyond, 61.
equal making it static. “New media artwork must keep moving to survive.”

John Ippolito, Curator of Media Arts at the Guggenheim, explains the inherent irony in new media and the threat to its conservation if museums employ static preservation models:

Unfortunately, many de facto custodians of culture – museum curators and conservators – are ill equipped to maximize an artwork’s adaptability, because their job usually seems to require that the artwork remain static. To safeguard the rich legacy of artistic media, born of the digital age and Internet revolutions, requires something more than storing an artist’s web site as a data file on a Windows-formatted CD-ROM. Within twenty years, the browser to read the data will have become obsolete; within thirty, the only CD-ROM drive may be in a vitrine in a computer museum; within forty Windows will be dead media, and within fifty, the CD itself will have delaminated. For digital culture, fixity equals death.

One of the major paradigm shifts in the development of conservation is the shift in “focus on media art works from physical object to information object.”

New media conservation has tended to mean documentation, archiving, or reformatting. “Conservation can become a matter of archiving the secondary materials and documenting the essential elements of the work for reinstallation, including acceptable substitute materials and tolerance for change in the exhibition environment.” Conceptual or process based works require the conservator to fully understand the concept and context underlying the artworks in order for the works to retain their artistic integrity. “One key point is that when preserving and re-presenting media-based works of art, we should give up the

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51 Ibid.
notion of a single, authentic object and view these works as sets of instructions rather than precious originals.”

Committed to prolonging the physical life of objects in the face of inevitable change, conservators are particularly vexed by Conceptual and other art that questions notions of permanence and deliberately employs ephemeral media… Their mission is to conserve not just the object but its cultural significance [which]…resides in the conceptual intention of the artist.

Some artists create pieces that intentionally deteriorate. “Ephemeral materials and unstable juxtapositions may convey symbolic meaning that expresses the artist’s intent but also knowingly leads to self-destruction.” Felix Gonzales-Torres’ candy sculptures, made simply of a pile of wrapped hard candies, beseech the viewer to remove a piece of candy. In these cases, conserving the physicality of the piece contradicts the intent of the artwork. These types of works led to a philosophical shift in art conservation but conservators are still unable to give feasible solutions. Christiane Paul of the Whitney Museum acknowledges the paradigm shift in art conservation. “The nature of new media projects and the collaborative process employed in their creation, curating, and presentation make it evident that writing a history of new media and preserving the art itself will require new models and criteria for documenting and preserving process and instability.”

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56 Ibid, 167.
57 Paul, New Media in the White Cube and Beyond, 6.
Often in new media, the object is contingent on the environment, found through digital data retrieval, or there may not even be an object. This shifts the focus of new media conservation towards artistic intent. Variable media’s lack of fixity, digital art’s inherent reproducibility and instability, or electronic art’s dependence on hardware and playback machines also means that the artist must authorize any reproductions, transfers of data, or iterations, unless a preliminary acquisition conversation makes stipulations ahead of time. The conservation of variable media and conceptual art requires an engagement with the artist that is truly unprecedented in art history. Certain institutions such as the Tate already interview the artist upon or prior to accessioning. The role of the museum conservator to initiate these contracts puts him in a position similar to the acquisitions committee and curators, indicating how these roles are blending in this new environment and the shifting responsibilities of conservators. Conservators have to be proactive members of the museum staff, thinking ahead and being involved in acquisitions and museum infrastructure, knowing what it will take in the future to keep their collection alive.

Another aspect of contemporary art conservation that has developed in response to the untraditional materials and process-based art is the search for individual solutions. Since all of these works behave so differently there is no common protocol. It is in the best interest of museums to develop a shared language and shared standards so they may facilitate collaborations. New media necessitates continual networking amongst conservators and their colleagues. Organizations that link contemporary museum professionals and allow them to
share their ideas and conservation methods are some of the most useful resources for dealing with these issues in new media and will be described in Chapter 5.

As artists are constantly plucking new technologies from the most experimental corners of the Earth, conservators will undoubtedly always be one step behind. Right now it takes a lot of people within an institution to conserve a new media work. The field of conservation is in the stages of developing to adequately meet the needs of technological, conceptual, and process based art, but what is lacking thus far is any institutional support or infrastructure to create a cohesive system of new media conservation within museums. Conservators “need the combined skills of archivists and cultural anthropologists. They are charged with documenting and archiving artists’ intentions as well as overseeing preservation strategies in the face of ever-shifting technologies.”

The fact that new media conservation involves a conservator, art historian, technician, artist or a representative changes the entire dynamics of the business and requires a specialist who can perform all of these functions. There are individuals who are capable of coming up with, initiating, and implementing the new methods of conservation within their individual institutions but cannot sustain these efforts on their own, and there is no academic program teaching these new skills to contemporary art conservators. “Eyes trained in traditional conservation are not necessarily prepared to see what matters in new media installations, where adaptability and change are the means, rather than an

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obstacle, to survive.”

Sometimes these services are contracted out which is helpful but also changes the role of the conservator.

Technicians with up-to-date knowledge from computer industries or the artists themselves conduct much of the hands-on work of preserving video and electronic art. This work includes “refreshing” (transferring onto new storage media), “migration” (upgrading equipment and software), and “emulation” (duplication on entirely new media). Specialized businesses are developing to carry out this technical work for museums. Master and submaster copies are archived for the future, while duplicates are distributed for exhibition. Part of the conservator’s role is to insure that highly specialized technicians comply with ethical conservation standards and parameters set by artists.

The artists’ roles have developed somewhat, too, because artists who work in variable media have become cognizant of the future of their work and that the technologies will change. They are eager to be part of a collaboration with the final owners of the works and understand the legal and curatorial and conservational elements involved. For example, Rafael Lozano-Hemmer relinquishes his rights to his works and turns them over to the curator because he understands the complexity of his variable electronic art works. Still, many artists do not think through to the distant future of their works. Glenn Wharton believes that this is a good thing because the works should not be conservation-driven. He reminds us that the conservator’s job is to preserve the work to the best of their abilities, but not to be heavy-handed or they risk dictating which media the artists will use and may end up limiting artistic creativity.

Established preservation ethics are in direct conflict with variable art.

“The deliberate deterioration of some contemporary works forces museums to

reconsider their preservation doctrine.” Artists retain moral rights to their works as defined by the Visual Artists Rights Act (1990). If an artwork changes, it is the artist’s prerogative to accept these changes or not but this can be hard when conservators have to recreate a performance or digital piece. Thankfully, VARA also protects the conservators’ rights, “The modification of a work of visual art which is the result of conservation…of the work is not a destruction, distortion, mutilation, or other modification…unless the modification is caused by gross negligence.” (paragraph 106A(c)(2)). This legal protection will be of great help when moving forward with trying to envision the work of art as a changing entity and its conservation as a process that enables the visual representation of the artist’s concept.

The following chapters will discuss the new conservation paradigm necessary for addressing the biases of new media, including opportunities for collaborative efforts between museums, academic institutions, library archiving techniques, and technology.

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62 Ibid, 165.
Chapter 4: Internet Art

Section 1: Crisis in Collection

As a subset of new media, Internet art (or web-art or net art) has its own specific set of inherent technical and conceptual obstacles to conservation, which make it particularly complicated to collect. Internet art conservation is faced with the changing technology of the hardware and software needed for the art to run, active viewer participation, licensing of software codes, and variability of the input. Museums have a hard time conserving something that is “potentially dynamic and nonlinear: even if a project is not interactive the viewer may look at a visualization driven by real-time data flow from the Internet that will never repeat itself or a database driven project that continuously reconfigures itself over time.”

Internet art does not generally present itself as a “linear, finished ‘product.’” The three reasons that Internet art has a “crisis of collection” are related to the difficulties in its conservation and illuminate the profound paradigm shift that must occur if museums are to collect and conserve Internet art:

Firstly, Internet art is considered to be a medium used for its openness and subversion of the exclusive gallery and museum value system of art. This freely accessible art is capable of creating its own system of validation outside the traditional structure of museums. “Net art is devising its own system of

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63 Paul, New Media in the White Cube and Beyond, 54.
64 Ibid, 54.
65 Dietz, “Collecting New Media Art: Just Like Anything Else, Only Different,” in Collecting the New: Museums and Contemporary Art, 85.
circulation and respectability” however there is no assurance of preservation in this independent system.

The primary issue regarding collecting ‘anti-institutional’ net art ultimately isn’t its content, but the general desire by many new-media artists for their work to continue to be freely and easily accessible – and appropriately displayed. Potentially, the museum can help enable this, especially over the long term, by taking on some of the burdensome support functions, recognizing that such freely available and often easily replicable works may also impact the museum’s traditional insistence on uniqueness or limited availability for objects in its collection.

Secondly, anytime a webpage is viewed, the act of retrieval creates a temporary licensing agreement from the host server to reproduce the code on the user’s computer. The legal framework for collecting new media art has not caught up with the complicated legal issues of licensing in Internet art.

Thirdly, curator Melinda Rackham finds that the problem exists in museum ideology: “The reasons people started making net art…to connect on a network and route around the censorship of the institutional and corporate world, mean that they (museums) will never want to treat it seriously – it’s still in opposition to their structure.” Internet art poses the most significant and pronounced threat to the structure and methods of museum practices. “There is a fundamental tension between the wide-ranging and open structures of the Internet and the traditional role of the museum as gatekeeper.”

66 Michael Rush, New Media in Art, 2nd ed (New York: Thames and Hudson, Ltd., 2005), 222.
67 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 88.
69 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 88.
Whether or not artists want their Internet art to be collected, the art would be better preserved, guaranteed to be hosted on a server, and it will be validated by the museum with the potential to make an impact on history as a venerated work representing our time, instead of fading into oblivion.

Section 2: Case Study

A work of art that has been collected by a museum is Mark Napier’s Net.flag (http://netflag.guggenheim.org/netflag), purchased in 2002 by the Guggenheim. The work invites participants to produce endless configurations of designs for an ambiguous national flag. The museum has managed to maintain the artwork as a live website, available online and accessible by current web browsers. An institution has venerated it but it is still freely accessible. Napier says, “I’m surprised it has lasted…and even happier that it’s still seen as relevant, which is really what matters. Artwork lives as long as artists and art historians talk about it.” The Guggenheim is still faced with considerations in terms of Net.flag’s preservation such as what flags should be included as raw material in the work, continual updating, or preserving previous iterations. If the decision were entirely up to Napier he would like to conserve Net.flag in a physical printed out version as well as the digital, live version. A long mural, perhaps, with all the flags presented, powerfully conveys the impact of all the visitors that have participated in the work over the years through the physical scale of such a print.

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70 See figure 2 in Image List
71 Mark Napier (Artist), interview by Jessica Hodin, August 13, 2009.
“Even if the program is lost, the prints can be conserved. It’s a strategy for disseminating an idea.”\textsuperscript{72}

Through the help of their conservators, who are actively seeking out supplementary training in electronic and time-based media, The Guggenheim has successfully collected and conserved Internet artworks by archiving web files on a server or CD-ROM and compiling data on “how the artwork is to be translated once its original hardware and software are obsolete.”\textsuperscript{73} Though digital standards may radically change, through the initiation of open dialogue with media artists and through the support of their Variable Media endowment “earmarked for future costs of data migration, emulation, and reprogramming,”\textsuperscript{74} the Guggenheim can evolve their technical preservation strategies to continually be able to host publicly accessible Internet art.

\textsuperscript{72} Mark Napier, interview August 13, 2009.
\textsuperscript{74} Ibid
Chapter 5: New Media Conservation

Section 1: New Media Conservation Goals

The nature of Internet, digital, time-based, and variable media requires that its conservation meet specific goals – more complex and at times more abstract than those of static media conservation. In addition to documentation of metadata, preserving the content of the artworks, and other tangible elements such as software and hardware components, new media conservation goals concern the essence of the work of art, its context, function, and behavior. Digital, time-based, and variable media conservation goals include ensuring continual access to the work, interoperability with a variety of institutions and systems, ability to be interactive, and ability to be recreated.

As mentioned in the previous chapter, new media conservation is often heavily dependent on externalities, such as live feeds, the exponential speed of developments in technology, the proprietary nature of software programs, or the servers used for hosting web-based artworks. New media conservation decisions can be subjective; for example whether to conserve the input and output for certain variable media is determined on a case-by-case basis and usually involves the direction of the artist and judgment of the curator.75 The subjectivity of new media conservation has yet to be factored into museums’ conservation policies. New media conservation cannot fit into the current model of traditional museum conservation. While there are varying opinions on how to structure museum

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75 “There are many reasons why preservation is problematic for new-media artworks, primarily having to do with the variability of both their input and output, the fast pace of change for underlying hardware and software, and the physical deterioration of components.” Dietz, “Collecting New Media Art: Just Like Anything Else, Only Different,” in Collecting the New: Museums and Contemporary Art, 96.
conservation around new media art, there are common goals unanimously accepted by conservators. The next step would be to codify the techniques and create a common language in order to make industry-wide progress and efficiency.

An artist chooses to work in a dynamic medium for its variable and performative characteristics; consequently, it may stretch beyond the scope of its conservation to preserve each outcome, performance, iteration, or variation. “An installation becomes just one possible version of a piece – a version that might never be reinstalled elsewhere.”\(^{76}\) For an artwork that changes physically and visually in each iteration, more value is found in conserving the behavior of the platform, rather than each manifestation. Behaviors are classified as: *interactive* (public modifies the work), *encoded* (a computer program is the score, directions, for the work), *networked* (“distributed across an electronic communications grid such as the Internet”\(^{77}\)), *contained* (stable media), *replicable* (“any medium that loses quality when copied, including analog prints, photographs, film, audio, and video”\(^{78}\)), *duplicated* (can be copied without impacting the media), *installed*, *migrated*, *performed*, and *reproduced*. Art can straddle these classifications; for example, many networked pieces are based on real-time interactivity, a situation that poses particularly challenging philosophical and technical issues. The MoMA’s recently acquired Internet artwork by Jonathan Harris and Sep Kamvar, “I Want You To Want Me” (2008) (see fig.1 in image list), culls live snippets of

\(^{76}\) Paul, *New Media in the White Cube and Beyond*, 65.
information from Internet dating sites, which themselves draw fifty million
visitors per month, meaning that the piece is constantly changing. The limitations
of conservation are based upon the museum’s capabilities and the agreements
made with the artists upon acquisition. Is the MoMA responsible for retaining all
the iterations in an archive? Do they have to keep it running all the time so no
snippets get missed?

“Every art project is embedded in a context, but the viewers of new media
works depend on contextual information.”\textsuperscript{79} Preservation of context is “needed
on both the human and technical levels.”\textsuperscript{80} Context conserves the information
needed to measure a reproduction of the work against its artist’s original
intentions, as well as to provide the proper environment for reception so the
audience comprehends the work and its intent.

New media contain static parts, subject to material decay just like paint on
canvas. The physical deterioration of hardware components destroys not only the
artwork but also the storage media that archives the works. CD-ROMs and other
storage media only last in stable condition for about five years. Continually
refreshing data to new physical storage devices is an important practice for new
media conservators.

\textsuperscript{79} Paul, \textit{New Media in the White Cube and Beyond}, 54.
\textsuperscript{80} Rinehart, “The Straw That Broke the Museum’s Back? Collecting and Preserving Digital Media
Art Works for the Next Century.”
While combating physical deterioration has always been the task of conservators, new media poses the more complex problem of software and hardware obsolescence, representing one of the biggest departures in the traditional conservation paradigm. Expert Jeff Rothenberg highlights the root of the problem as it pertains to digital media: “Not only are digital documents vulnerable to loss via media decay and obsolescence, but they become equally inaccessible and unreadable if the software needed to interpret them – or the hardware on which that software runs – is lost or becomes obsolete.”81 Data’s tendency to erode does effect its lifetime, but the real culprit is the new technology for reading the data that continuously renders older technologies unavailable or incompatible. Rhizome’s Digital Technology Coordinator, Nick Hasty says, “If you don't have the correct version of a software, then the work may not load or may load differently. Paintings, sculptures, etc don't really have this element as they are not rendered by software or compiled by machines.”82

Unfortunately, technology companies want to move forward, while conservators are best served if time stands still. Although new technologies and archival quality storage minimize the physical deterioration of the medium, they, too, will soon be replaced by even faster, increased capacity, more convenient, and lower priced media that are incompatible with the older systems and equipment.83 “This is a natural outgrowth of the exponential improvement in

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82 Nick Hasty (Technology Director, Rhizome, New York), interview by Jessica Hodin, August 2009.
83 “The National Media Lab has published test results for a wide range of tapes, magnetic disks, CD-ROMs, and other media (Van Bogart 1996), showing that a tape, disk, or even CD that is picked at random (that is, without prior evaluation of the vendor or the specific batch of media) is
storage density, speed, and cost that has characterized digital media development for the past several decades: the market makes older storage media obsolete as newer, better media become available.”

For example, the floppy-disc drive became obsolete, along with the software required to read the data stored on the floppy. A current operating system on a current computer model without a floppy-disc drive could not read a floppy, even if it were connected to an external floppy disc drive. And this is just one example; “How long before photographers lament the demise of JPEGs, TIFFs and GIFs?”

An important objective of new media conservation is ensuring continual access to a work of art in the sense that it must be available in the future. Access may pertain to retrieval on a website, which is potentially inhibited by Internet obsolescence. Conservation of software is shackled to the legalities of its industry. Pulling up a website or a piece of web art on a computer intrinsically strikes a licensing agreement between the Internet host and the individual computer. Conservation has to maintain these licenses so that access to the works can be preserved. Also, licensed software, controlled by a corporation, may be modified or pulled from the market at any time, making older software

unlikely to have a lifetime of even five years (Lancaster 1986). Even if archival quality media were introduced in the market, they would probably fail, since they would quickly be made obsolete—despite their physical longevity—by newer media having increased capacity, higher speed, greater convenience, and lower price (Schurer 1998). This is a natural outgrowth of the exponential improvement in storage density, speed, and cost that has characterized digital media development for the past several decades: the market makes older storage media obsolete as newer, better media become available.”


incompatible with new hardware models. The software industry fortunately makes constant innovation and change in their products, which unfortunately, complicates museum conservation. Artists and museums prefer to use open source software to avoid the potential of a licensing agreement running out and thwarting the life of the work.

The idea of access also pertains to the digital archive; expert Don Waters is concerned with the concept of organized access, tagging items so that they can be found within the vast space of stored electronic and digital media. If a work cannot be found through a keyword search, it might as well not exist. “The demand for access creates the ‘object’, that is, the act of retrieval precipitates the temporary reassembling of 0s and 1s into a meaningful sequence that can be decoded by software and hardware.”

An artwork may be a platform for receiving input and producing output so it is important that the ability to be interactive can also be conserved. Steve Dietz makes the analogy between preservation of early non-digital performance pieces, such as those by Sol LeWitt, and net art. “As with the LeWitt, the artwork that is collected is the instruction set, and the artwork that is experienced is its execution.” When the art object can only be preserved through documentation, conservators focus instead on conserving the directions (in performance art) or digital code (in digital art) that is the basis for the work’s behavior when in action. LeWitt’s performative wall drawings are recreated based on a set of instructions,

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87 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 89.
88 See Figure 3 in Image List
and the outcome is slightly varied each time the instructions are carried out. The wall itself and the instructions can both be conserved.

Dietz continues, “The parallels [between LeWitt and] new-media art are striking. In a sense, the input is the room’s dimensions, the algorithms are LeWitt’s instructions, and the output is the drawings on the walls.” On the other hand, the volume and speed in which computer art can be generated by input being culled from the Internet or another data source and plugged into the digital instructions create outputs on such a high volume that they may even be infinite and uncontrollable. As mentioned, with this kind of scope, the goal of conserving variable digital works is to preserve the instructions (or code) with information on how the artwork is supposed to behave.

Section 2: New Media Conservation Techniques

Above all, leading experts feel strongly about the need for communication among institutions and organizations as a real method of conservation. Metadata and software and hardware techniques have to be shared and platforms need to be operable in different institutions. The experts also acknowledge that not every piece can be preserved and often new media conservation takes the form of recreation. Jeff Rothenberg, John Ippolito, and Richard Rinehart support recreation of original digital artwork according to a set of instructions and Rinehart has devised a formal notation system (explained later in this chapter) that would carry out the reproduction of artworks in a standardized way across institutional boundaries. Experts disagree, however, on whether imposing

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89 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 89.
standards of best practice and uniform techniques would be beneficial or if relying on standards to keep digital files readable, or to sustain old hardware and software, stagnates technological advance. Conservators, curators, information scientists, artists, and technology experts have all devised numerous and diverse strategies for approaching the aforementioned goals of new media conservation.

Context and function are generally preserved through the collection of metadata, or descriptions of the work and how it should operate. Collecting metadata takes such forms as interviews with the artist, notes, or original documentation. Some strategies for documentation of digital information include printing out a hard copy of the information so if it changes you can see what led to the new iterations, descriptive documentation of the context, and documentation of the artistic intent. Preserving context is not only a matter of documentation but is also a proactive activity in which curators and conservators produce “new educational and scholarly materials which facilitate access and understanding.”90 The preservation of context through documentation can be a time-consuming step depending on how in-depth the conservator goes, but the more information collected, the better able they are to preserve and recreate the art. “It has proved invaluable to preserve as many of the original artifacts alongside original documentation as possible. This allows for some amount of

‘recreation’ and interpretation of the work in lieu of having an absolute object to consult.”

In the early stages of digital technology, the belief that digital “objects” were more stable than analog was attributed to their ability to be copied, the perceived durability of their advanced materials, and a confidence in their advanced technology. New media has this unique advantage of being able to be copied perfectly and still be authentic, whereas a replica of a sculpture or painting is considered a fake. Art has moved on from the idea of craftsmanship to emphasizing the importance of a concept, “what is important today is not technical skill, but skill in playing inventively with concept.”

Digital documents allow for back up, but even those reinforcements are subject to physical deterioration and also to technological obsolescence. Backing up digital files requires not only copying but also translating to new software platforms so it can be continually read by new software and hardware. Instead of solving the problem, digitizing creates a new dually problematic situation just with a different, but possibly more manageable, solution. Digitizing analog media is a short-term solution. “Even if the media could be physically well-preserved, rapid changes in the means of recording, in the formats for storage, and in the software for use threaten…the life of information in the digital age…”

Therefore, preservation of digital media means “refreshing information from old...

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91 Ibid.
to new technologies.”\textsuperscript{94} In addition, the ability to access and view the works is in just as much danger as it was while in analog form.

Digitally duplicating media is a helpful preventative preservation strategy, nevertheless, because digital back ups of analog media and duplicates of digital-born works require little effort and storage space. Each copy is not more stable in itself (in fact each copy bears the risk of becoming slightly more removed from the original in its content and behavior) but having multiple copies bolsters the stability of any one piece and is useful for comparing the updated files to the first generation files. As a precautionary measure, there is little downside; if digital information is copied correctly, the original may not be altered at all.\textsuperscript{95}

Data redundancy is a very useful strategy but it is worthwhile to consider its departure from the museum’s economic and strategic model in which they brand themselves on their unique collections.\textsuperscript{96} “Although [building a shared collection of art] has a precedent in the national collections of certain countries, this move flies in the face of consumerist logic of museum branding.”\textsuperscript{97} Museums accessioning duplicable media may be threatening the unique one-of-a-kind exclusivity of their collections, but as a preservation strategy, duplication is very helpful. Museums would be able to collect the same work of digital art and spread the responsibility for its care.\textsuperscript{98}

\textsuperscript{94} Ibid.
\textsuperscript{95} Rinehart, “The Straw That Broke the Museum’s Back? Collecting and Preserving Digital Media Art Works for the Next Century.”
\textsuperscript{97} John Ippolito, “Death by Wall Label,” (August, 2008).
\textsuperscript{98} Rinehart, “The Straw That Broke the Museum’s Back? Collecting and Preserving Digital Media Art Works for the Next Century.”
The static preservation option keeps all original elements in hard copy for as long as possible, i.e. original storage media and original software and hardware necessary to access and run the original art. 99 Printing the documents saves the content but admittedly, neglects the functionality and original form. 100 Static preservation falls short because museums would have to devote enormous time and money to preserving the numerous hardware platforms and software applications. 101 And museums cannot rely on running obsolete systems as a long-term preservation strategy because they, too, will break down. Stockpiling hardware takes up too much space and would only be useful for one specific work of art because eventually any software or hardware introduced into the museum collection will be incompatible with this ancient hardware. Preserving hardware is inconvenient, costly, and subject to inevitable failure. “For many media-based acquisitions, museums will purchase the equipment necessary to run them as protection against the equipment not being available at some future date.” 102 However, “It is not feasible for the arts community to keep the original equipment and software in working order over the centuries and industry has no incentive to continue producing old parts or to keep all new equipment backward compatible.” 103

99 Ibid.
102 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 96.
Only in the case where the look and feel of the old hardware is essential to the aesthetics of the piece would it be recommended for conservators to stockpile or keep the old hardware in working order, for as long as possible. Mentioned later in this chapter, emulation is a practical tool for recreating old operating systems in new hardware devices for pieces that do not rely on the look and feel of the old hardware to convey the message of the piece. Ironically, the strength of static preservation in new media is its recognition and acceptance that “in many cases these art forms were created to contradict and bypass the traditional art world’s values and resulting practices.”\textsuperscript{104} However, it hardly strengthens the greater art community, because the works cannot be widely accessed, and because it has been proven that this is an economically, spatially, and technologically unfeasible strategy for museums.

Migration and translation are viable solutions to the continual quandary of hardware and software obsolescence. Migration works by copying digital information from outdated media to new updated media and formats. Continually refreshing the data ensures that the content remains readable by current software and hardware. \textit{Translation} is the process of converting the data.

Refreshing digital content to an updated storage medium “is no guarantee that the file itself can be read or executed. Very few institutions can still read WordStar word-processing files, even if they have been refreshed from their original 5 ¼ in. floppies to brand new DVDs…” Migration, as a conservation

\textsuperscript{104} Ibid, 2.
strategy, is basically “refreshing information from old to new technologies” and is not always entirely effective. Translations prioritize the raw digital data over the data’s behavior, which could potentially mutate the content in unauthorized ways. This high risk of loss involved in migrating data, especially when migrated between paradigms, is unacceptable when dealing with art. The migration, translation approach is “short-sighted, labor-intensive, and ultimately incapable of preserving digital documents in their original forms.”

*Emulation*, however, “promises predictable, cost-effective preservation of the original documents by means of running their original software on future computers.” Emulation programs “simulate the working of older systems, enabling us to run works written with old programs on new computers.” While migration essentially preserves the content, emulation is a more advanced step that preserves the format on which the content runs. Emulation software encodes contemporary systems to mimic older software and hardware “thus giving a working solution for highest fidelity in reproducing the original work of digital art.” The emulation of obsolete hardware “would involve encapsulating digital documents, the original application software used to create it, and the operating

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108 Ibid.
system used to run both in a software wrapper which describes the required hardware environment.”\textsuperscript{111}

Emulation has been successfully applied outside the art world, for example in recreating video games to play on computers. Video games function similarly to digital-born, variable works of art; the difference is that the iterations (each game played) are not important to save. The profound development of video game technology makes Nintendo’s first Home entertainment systems, launched in 1985, seem like antiques. Nintendo no longer produces the hardware systems (consoles), the software (games), or any of the parts to replace ones that are broken or missing. Although these games are sought out by game-lovers for their coveted vintage appeal, and although they represent an important piece of Japanese and American culture, it is no longer in the commercial interest of the company to produce old technology. For nostalgic fans of the retro version of Super Mario Bros. emulation software is available to mimic the old game on a computer platform.

Jeff Rothenberg, a proponent of emulation of software and operating systems, believes it “allow[s] the content of digital information objects to be carried forward and used in its original format.”\textsuperscript{112} The automatic processes of emulation “guarantees fidelity, efficiency, scalability and ultimately feasibility.”\textsuperscript{113} But emulation is not a process that can be let loose to its own devices. Human touch and judgment will be required for emulation as part of the

\textsuperscript{111} Ibid.
\textsuperscript{113} Rinehart, “The Straw That Broke the Museum’s Back? Collecting and Preserving Digital Media Art Works for the Next Century.”
data package.\textsuperscript{114} “Retrieving or re-presenting the digital art work then becomes a continuum of options facilitated by emulation and automation at one end and human intervention on the other.”\textsuperscript{115} Therefore, emulation needs to be done not by computer technicians but by someone who also understands the art and the goals of conservation.

Emulation is expensive and has to occur every time a new operating system comes out, so the MoMA is looking at encapsulation, reducing the files into their digital elements so they can be built back up. Encapsulation is a developing technology and is not available yet.

Richard Rinehart, Digital Media Director at UC Berkeley Art Museum and Pacific Film Archive, proposes the “layered” use of three preservation strategies: static preservation for physical components such as installation objects, hardware, and documentation; migration for museum data records of original data and documentation; and emulation applied to the artwork, the operating system and the application needed to retrieve it.\textsuperscript{116}

At the same time, Rinehart recognizes that there is no single solution to preserving digital media art. He has devised a Media Art Notation System (MANS) that he hopes will make a practical and useful contribution to the field and would be applicable to any digital media preservation situation. MANS works like a musical score, which is essentially a formal notation for playing and recreating a song. Anyone who knows how to read musical notes can reproduce the music. “Scores created using MANS would serve as guides for people to re-

\textsuperscript{114} Ibid.  
\textsuperscript{115} Ibid.  
\textsuperscript{116} Ibid.
create or re-perform a work for an exhibition…This feasible level of implementation would create an interoperable record of the work, a guide to re-creation, and a way to maintain the integrity and cohesion of complex works into the future.” Artist Mark Napier agrees with the analogy to music:

We take for granted that music can be performed and re-enacted, but for visual art this is a new concept. Software and digital art cross that line between visual art and music, creating a form that has elements of a static object and also elements of live performance. To accurately conserve the work you need to consider the nuances of the performative aspects of the piece.

In addition to preservation and recreation, Rinehart identifies other reasons for a formal notation system, which help to achieve the majority of the goals of new media conservation previously listed:

A documentation format
An architecture for media art management databases
A framework for online public access catalogs of media art
For educational and community forums dedicated to media art
A framework for generative and collaborative artist networks
A metadata framework for the digital library and broader cultural informatics communities

This last capability of MANS is useful for creating an archive of new media works within a museum.

Rinehart lists eight requirements for a formal notation system, paraphrased below, that address many of the conservation issues outlined in the beginning of this chapter. A formal notation system must:

1. be “appropriate to the content and purposes it is intended to serve”

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118 Mark Napier, interview August 13, 2009.
2. describe the art work
3. be “a guide to aid in the re-creation of re-performance of the work.”
4. “provide interoperability with other descriptive and technical standards that digital media
   art interacts with, including cultural informatics, library and museum standards, and
   media industry standards…so that documentation for media art works does not remain
   marginalized, but can instead easily co-exist alongside traditional art documentation
   within larger databases or systems…Needs to include the level of detail needed not just to
   describe the works, but to re-create them.”
5. “employ an expression format that is standardized so that the development of software
   tools, training, documentation, and support is feasible for the arts community and
   leverages larger community or industry efforts.”
6. “integrate both human-readable (natural language) layers that allow high-level
   functionality and machine-readable (artificial/encoded language) layer that allow for
   automated processing.”
7. be “practical, cost-effective, scaleable, and tractable”
8. “allow for varying levels of implementation from minimal scores to complex scores that
   are expanded upon at various points in the life cycle of the work.”

A formal notation system would address the issue of access, because all
organizations and institutions would have the ability to read and run the same
codes. The “baseline expression format”\textsuperscript{120} of the score would be in XML,
already a standardized syntactical expression, independent of any particular
hardware or software environment, thus satisfying the requirement of
interoperability. XML is also a useful expression because it is a natural language
text, not only machine-readable for computer-mediated processing, but also
decipherable by humans, with minimum interpretation.\textsuperscript{122} Rinehart believes XML
to be durable for preservation, transparent, and able to include support for
descriptive metadata. Specifically, the DIDL dialect would be able to translate
the abstract, conceptual specifications of the art into a useful digital format.

\textsuperscript{120} Ibid, 4-5.
\textsuperscript{121} Ibid, 7.
\textsuperscript{122} Ibid, 7.
DIDL works for variable media that has many iterations and parts because the “broad description [of the artwork] could be formed by the artist or museum at the time the work is created or collected. Further details, alternate accounts, and audience annotations could be filled in later in the life of the work.”

Although Rinehart’s prescription aims to provide a homogeneous language to ensure access and interoperability, he believes that it will only work if the artists, museums, and cultural informatics community have a large amount of freedom to critique, refine, create, and integrate all the existing models for digital preservation. “Formal notation systems necessarily embody trade-offs in their level of abstraction; too abstract and they lack capacity for integrity, too prescriptive and they lack portability and robustness. So, a media art score would share the goal of a musical score not to provide the perfect recipe, but the best possible one.”

Another strategy, PANIC (Preservation and Archival of New Media Interactive Collections) emphasizes the need for software tools in the search for long-term preservation strategies. CMCM (Capturing Unstable Media Conceptual Model) also “recognizes the importance of collaboration and distributed authorship” and is self-described as “an approach between archiving

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123 Ibid, 9.
124 Ibid, 12.
125 Ibid, 3-4.
and preservation.” There are many other organized strategies out there, both established and in their infancy, pointing to a real surge in interest in this field, and the recognition on an international scale for solutions to media obsolescence, deterioration, and inaccessibility.

Section 3: New Media Conservation Groups

The key to progress in digital preservation is collaboration among museums and collecting organizations, as demonstrated in the priorities of various external preservation groups and initiatives that are establishing industry-wide standards for preserving media works. Collaboration allows conservators to share the workload, draw upon an array of diverse specialties, and maximize the chances of securing vital funding. Steve Dietz concurs, “Finding [scalable, sustainable solutions] is unlikely to happen at the level of the individual institution.” New media conservation’s advantage over static art is that “because networked new-media art is not dependent on physical location for viewing it is possible for institutions to share infrastructure, such as servers, technical staff, and hosting.” Examples of groups working to standardize media conservation are outlined below:

International Network for the Conservation of Contemporary Art

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128 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 98.
129 Ibid, 98.
INCCA is a platform for information exchange on artistic intent that relies on active membership to produce a shared database. Started in 1999, their mission to “develop, share, and preserve knowledge needed for the conservation of modern and contemporary art”\(^{130}\) is achieved through establishing a digital archive of artists’ intentions through a metadatabase of references to unpublished documents held by member institutions, such as video interviews, notes from conversations, and analysis of materials used by individual artists. Their theory is that gathering and disseminating information from the artist on technical analysis and conceptual intent is “essential for developing the best preservation strategies for these increasingly complex works of art.”\(^{131}\)

The Variable Media Initiative

Originated at the Guggenheim Museum in 2003 by Associate Director of Media Arts Jon Ippolito, the VMI is a multi-institutional shared database for museum staff of information pertaining to the reinstallation of nontraditional artwork. Now the work of a consortium of institutions, archives, and funders, and available online to the general public, VMI “prepare[s] for the obsolescence of ephemeral technology by encouraging artists to envision the possible acceptable forms their work might take”\(^{132}\) and “how a work might be translated into a new medium in the future once its current medium expires.”\(^{133}\) VMI has strict standards for its metadata and assigns categories by medium-independent

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\(^{131}\) Ibid.

\(^{132}\) Dietz, “Curating Net Art,” in *New Media in the White Cube and Beyond*, 95.

behaviors, since the media are often mixed and change with each migration and emulation.\textsuperscript{134} Dietz explains the innovativeness of the Variable Media Initiative and how it plays to the biases of the new media: “Museums have interviewed artists about their work before, but the VMI is radically explicit about the mutability of much contemporary art and attempts to provide a standard framework for both artists and museum personnel to understand what really matters to the artist for any particular work of art.”\textsuperscript{135}

VMI has re-conceptualized the collecting process because it assumes that collecting documentation should be part of the acquisitions process. When new media art is emulated or recreated without the input of the artist, decisions of aesthetics and visual elements (color depth, screen resolution, and tempo) have to be made.\textsuperscript{136} VMI ensures that when the art has to be emulated, this kind of aesthetic guidance will not have to be made by a secondary party. In conjunction with the Variable Media Initiative at the Guggenheim Museum, the exhibition “Seeing Double” presented new media works side by side with their emulated, recreated versions “which had been ‘upgraded’ to newer, current technological platforms.” Some works were emulated, some were migrated, and the audience was able to see the difference between the two techniques and which one came closer to the original work of art.\textsuperscript{137}

\textsuperscript{134} Wharton, “The Challenges of Conserving Contemporary Art,” In Collecting the New: Museums and Contemporary Art, 174-175.
\textsuperscript{135} Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 98.
\textsuperscript{136} John Ippolito, “Death by Wall Label,” (August, 2008).
\textsuperscript{137} Paul, New Media in the White Cube and Beyond, 7.
The Open Art Network addresses the paradox that software and net-art rely on an open network for exhibition, interaction, and preservation, but need to remain legally private in order to protect their value and limited reproduction. The paradigm of collecting a unique object conflicts with the multiple and open structure of new media art. Computer artists are increasingly attempting to hide their source codes so their art remains proprietary, but hiding these codes threatens the artwork’s lifespan because it cannot be reproduced or updated to newer technology. OAN’s preventative approach to conservation encourages artists to distribute duplicable works in open source and legally protects their continued rights to access their master source codes after the work has been sold and title has been transferred.

The ability to duplicate works has legal implications but is a property of digital art that enables it to be preserved. In photography, etching, and engraving limited edition print masters are destroyed once the prints are produced, to avoid unauthorized copies from being made. As a fundamental difference, digital works’ retention of the master original “is absolutely critical when content will eventually need to be delivered with a more advanced technology.” To balance data redundancy with some sort of protection against endless duplication, “the Open Art Network has proposed the creation of a new flavor of open license that guarantees that a work's source, as well as its executable version, will be available

Due to the increased vulnerability of code-based works to technological obsolescence, artists can preserve their legacy by sharing the code with a legally-bound third party.

According to such an agreement, a video artist might deliver to a collector or museum a duplicate master along with the artwork with the understanding that the artwork’s owner cannot access the master until the artist gives permission or dies. A neutral third party could serve as an artistic escrow account, holding artist’s source code until the time when a need for open access outweighed their proprietary interest in keeping it secret…In the case of an artwork, it may not be a licensee who gets access, but cultural organizations—online or off—or the public at large.  

Forging the Future

The Forging the Future consortium consists of “museums and cultural heritage organizations dedicated to exploring, developing, and sharing new vocabularies and tools for cultural preservation.” Forging the Future addresses the problems of technological obsolescence, granting access to the closed legal system of digital rights managements, and the lack of structured input allowed in conventional documentation systems currently used by collecting organizations. Most importantly, FtF created tools to address “that artifacts of the digital era must change to survive into future decades and centuries.”

Similar to Rinehart’s qualifications for MANS, the viable tools must be easily accessible, non-proprietary, open source, and therefore able to reach a wide demographic. They must be adaptable and able to read data using a common computer language. The tools of FtF are the Franklin Furnace Database, for cataloging variable media artworks and events contained in small to midsize

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139 The Open Art Network website. http://www.three.org/openart/
142 Ibid.
collections of presenting arts organizations; the Digital Asset Management Database; and the Variable Media Questionnaire, which contains data and metadata necessary to migrate, re-create, and preserve cataloged variable media objects.\textsuperscript{143}

Forging the Future takes a similar approach as the Variable Media Initiative in prioritizing documentation of an artwork’s behavior and its artist’s intent over its medium and physical characteristics. “The variable media paradigm asks creators themselves, rather than just technicians and conservators, to imagine ways to outwit the obsolescence that often besets technological and other ephemeral art forms.”\textsuperscript{144} VMI and Forging the Future both believe in questionnaires as “instruments for determining creators’ intent as to how their work should be categorized, seen, and (if at all) re-created in the future.”\textsuperscript{145} The metaserver pulls all of the information together as a centralized archive, but with the added ability to accept information from the community.

\textbf{The Pool}

The Pool is an interactive Internet-based resource to share online art and code. The community of users can upload projects and comment on, rate, or contribute to others’ projects. “In place of the single-artist, single-work paradigm favored by the majority of documentation systems, The Pool stimulates and documents collaboration in a variety of forms.”\textsuperscript{146} As each work is varied, its

\begin{flushleft}
\textsuperscript{143} Ibid.
\textsuperscript{144} Ibid.
\textsuperscript{145} Ibid.
\textsuperscript{146} John Ippolito, “Death by Wall Label,” (August, 2008).
\end{flushleft}
original form and concept is still distinguishable from its subsequent versions but the Pool is designed to allow users to follow the trajectory of the work as has been built upon by other artists. The Pool tracks three phases: the intent (the suggestion for a project), approach, (interpretation of an intent), and release (“prototypes or finished projects, implemented in the medium intended for public distribution”). 147 The Pool’s contribution to new media preservation and digital archiving is firstly, its encouragement of adaptable projects through the acknowledgement “that new media works evolve differently than static artifacts”148 and secondly, its ability to search for projects and find all of the iterations.

Electronic Media Group

The American Institute for Conservation recently established a specialty program for electronic media that focuses on preservation of audio, video, digital, web-based and “time-based” media and art. EMG emphasizes communication and networking among museum professionals with the specific mission “to provide a means for conservators and related professionals to develop and maintain knowledge of relevant new media and emerging technologies.”149 EMG’s literature and workshops cover creation and maintenance of digital archives, digital metadata for access to collection materials, and documentation and conservation of electronic playback equipment and computer software and

147 Ibid.
148 Ibid.
hardware.\textsuperscript{150} AIC’s establishment of a group dedicated solely to these issues indicates the significance as well as the recognition and prioritization of evolving the paradigm and mission of conservation within museums.

**Independent Media Arts Preservation**

IMAP is geared towards the preservation of electronic and time-based media. IMAP acts as a national resource providing cultural custodians with information, an innovative cataloguing system, training and education, and advocacy. Composed of various organizations, media collectors, and institutions, IMAP tries to fill the gap in existing preservation efforts for media collections. Its most important contribution to the field has been a cataloging project, created for those untrained in archival management, and available as a template and online tutorial. Through helping organizations ensure the longevity of their media, IMAP “ultimately facilitates access to these significant cultural materials.”\textsuperscript{151}

There are many more institutions involved in innovative research and formulating guides and reports on new media preservation standards and best practices. The New Art Trust is a private, non-profit consortium based in San Francisco, founded in 1997 by collectors Pamela and C. Richard Kramlich to promote technology-based arts. The institutions that make up the consortium, the Museum of Modern Art, the Tate, and the San Francisco Museum of Modern Art,

\textsuperscript{150} Ibid.
\textsuperscript{151} Independent Media Arts Preservation website. http://www.imappreserve.org/about/index.html
have collaborated on a set of guidelines through their project called Matters in Media Art, which “aims to raise awareness of the requirements of these works and to provide a practical response to the need for international agreement among museums.”

As an individual institution, the MoMA’s media department is launching a project to examine and inventory their two hundred computer-based works so they can be moved to servers. The MoMA is looking for a safer repository for all their media that has digital files associated in which the files will be checked for digital corruption and where technical metadata will be stored as a second level record. All necessary to render these works playable in the future. MoMA is also looking at encapsulation techniques to preserve their digital works.

The Canadian Heritage Information Network (CHIN) has a wonderful guide to museum best practices in developing, presenting, and preserving digital heritage content, and although the site is specific to Canadian laws and policies, the Intellectual Property section has legal and economic models for administering museum IP that can be useful for inspiring American institutions.

Space does not permit a detailed summary of every single organization working in media art preservation. It is evident by the sheer number of these groups that there is a recognized need for standards in preservation of digital, time-based, variable, and electronic media artworks.

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152 Matters in Media Art website. http://www.moma.org/explore/collection/conservation/media_art
Chapter 6: The Archive

Ultimately, the solution to the conservation of museums’ digital, time-based, Internet, and variable media collections is the creation of an archive based on the library archival model. The utility of the archive is that it integrates most all of the technologies and achieves the goals discussed in chapter 4 of this dissertation. Three necessary support mechanisms enable the archive: first, an educational component, to train new media conservators in a combination of art history, technology, and library informatics, second, a standard, nonproprietary language for the open flow of information and third, technological advances in open source, archival software. Effective collaborators for facilitating the integration of this trinity would be libraries, educational organizations, and technology developers.

The goal of the archival system is to develop an accessible digital archive containing the works themselves plus the metadata provided by the artists and ascertained by curators and conservators and be able to share this information amongst institutions. The metadata documentation is essential to store in an archive because it is like an artist’s sketch, revealing intent and context and informing reinstallation. Metadata accompanies the works in an archive so that each has a distinct taxonomy through its “tags” that allows it to be located and accessed. An archive minimizes the weaknesses of digital media by addressing accessibility and technological obsolescence. An archive maximizes the strengths of computer-based media by its coupling of the artworks and their contexts, and it
takes advantage of the media’s ability to be translated into a language that enables sharing information. Media theorist Friedrich Kittler was basically describing this kind of archive when he argued strongly in his essay “Museums on the Digital Frontier” (1995) that one of the significant opportunities for museums in the digital age is to create digital collections that are the artworks and the context for the artworks.

The parallels between libraries and art institutions highlight a natural association between library archival systems and museum conservation. In his 1970 “Museum Manifesto,” former AAM President Joseph Veach Noble described the five functions of a museum: to collect, conserve, study, interpret, and exhibit. An updated version of this analysis by museologist Peter van Mensch reduced the museum’s functions to three: preserve (collecting is the prerequisite), study, and communicate (combination of interpret and exhibit). This condensed list of functions is similar to the three functions of a library to preserve, develop, and manage. John Henry Merryman’s conclusion regarding the basic framework of any public policy with respect to cultural property (assumedly held in libraries and museums) is even more similar to the library’s three functions, “the ordered triad of preservation, truth, and access.” However similar in their functions, museums have slightly different objectives from libraries; a museum cannot sit idly by and wait for someone to search and access their collection. A museum is

153 Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 96.
154 Steven Weil, “Rethinking the Museum: An Emerging New Paradigm,” in Reinventing the Museum, ed. Gail Anderson (Walnut Creek: AltaMira Pres, 2004), 74-75.
155 Ibid. 74-75.
responsible for more complex cultural duties to exhibit and interpret or communicate. An ideal conservation archive would allow for the same level of access and preservation as libraries, with the additional ability for curatorial creativity.

According to Rinehart, the museum already provides authentication, continual access, and public registry for traditional works of art, but he asks, “Can they fill those roles with regards to digital art, and if so, how?” Libraries already fulfill these roles to meet these basic requirements for long-term preservation and open flow of digital information so museums may look to library informatics for a relevant model of preservation of digital information. Already, the word “archive” is being re-appropriated in the museum world. Conservation is now often referred to as “archiving” and The Smithsonian, interestingly, evaluates curators and archivists under the same criteria, indicating that the difference between the two positions is collapsing.

Library systems are much more advanced than museums. Museums could look to how libraries consider documentation in their archive, whereas museums have generally been concerned with preserving the finished product. Special Collections Director at NYU’s Library, Marvin Taylor, says in fetishizing the individual object, museums have failed to develop a system that is capable of

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157 “Authors and publishers must be able to register publicly the existence and location of their intellectual property...readers must have the ability to verify that the attribution of authorship in a document is true and that the copy at which he or she is looking had the same content as the version that the author originally created...and authors and readers must have access to an accumulated store of knowledge that is preserved from the past and will be preserved into the future.” Don Waters, “Some Considerations on the Archiving of Digital Information,” Yale University Library (January, 1995).
dealing with the infinite amount of art that needs to be preserved whereas libraries are used to dealing in bulk. 158 Museums label artist correspondence “ephemera,” whereas archival systems view them as “primary source material,” illustrating the differences in their priorities as well as lack of a shared vocabulary.

The limitations of an archive are primarily in the amount of metadata that can be stored because if everything were fully tagged the archive would be too bogged down. But when recreating, how does one capture the experience of a work of art without enough metadata?

As a pragmatic culture we have an affinity for archiving and preserving even the ephemeral. Theorist Walter Benjamin believed archiving is inherently futile for time-based works because he perceived the archive as a mere “papertrail of photographs, sales records, loan forms, and letters...”159 However, if an infrastructure does not step in to archive and save all of this cultural material, our culture is going to be left with unreadable storage media and worn out hardware.

Educational training is the first criterion for establishing an archive. Operation and organization of the archive tool will have to be managed by those knowledgeable in art, library informatics, and technology. “You have to be empathetic to artistic intent and context as you make pragmatic decisions about how to present and archive materials.”160 Having a balanced understanding of

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158 Marvin Taylor (Fales Special Collections Manager, NYU), interview by Jessica Hodin, October 5, 2009.
159 Schaffner and Winzen, Deep Storage: Collecting, Storing, and Archiving in Art, 18.
160 Nick Hasty, interview August 2009.
and expertise in art and technology, like Glenn Wharton at MoMA, Marvin Taylor at NYU is crucial but rare. Even trained electronic media conservators rely on technical engineers. “I don’t think this means that curators must become coders, but a different level of familiarity and accessibility is needed.”

A shift in the conceptual model of conservation is an obligatory component to this new training. New media conservation demands an approach in which conservators operate under the assumption that works can change over time. In digital art the *original* is a debatable concept because software can be copied, and algorithms can be rewritten in new languages. The best media conservators perceive art “as a succession of linked events that, like a stream of water, endures by remaining variable.” Philosophically, in postmodernism, the authentic version of a work is malleable. Although this makes the institutional art world very uncomfortable, for the most part the artists themselves accept the mutability of their work and are not worried about slight alterations that may result as an interesting comment on the passage of time.

Few artists look ahead into the future of their works’ survival and their common use of proprietary software is risky to museum collection. If proprietary software enters the collection the conservators only have two options: maintain old software so the piece can be run in its original format until the software is obsolete, or try to extend the life of the work by emulating the software, and slightly changing the work—an option that must be acceptable to the artists and

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161 Dietz, “Curating Net Art,” in *New Media in the White Cube and Beyond*, 93.
within the art community if new media preservation is going to be able to move forward.

Museum conservation has been mostly focused on conserving things in their original state but for digital art that is nearly impossible. New media art will almost always be a recreation of the work based on what is left of the creator’s idea, a concept that new media conservators will need to internalize. A good archive will be capable of evolving with the media.

The second criterion for an archive is a shared language and shared standards to support interoperability between institutions. Undoubtedly, museums will not be able to build a serious archival program by themselves and will collaborate with libraries and institutional repositories that have expertise in long-term preservation. The Institute of Museum and Library Services, a federal grant-making organization for museums and libraries, stipulates that collaboration between a museum and an archive not be within the same institution, proving that the means for creating archives, i.e. money for research, will only be available if museums and libraries collaborate.

Standards for museums need to be flexible and transferable so they can be tailored to each individual work of art. Libraries have a developed expertise in creating a consistent language for archival finding aids, one that is flexible enough for museums to adapt and expand to all types of description. However, the problem with adopting the current standards in libraries is that the tools are proprietary, for instance the Archivist Tool Kit, used by NYU libraries, can not be
used for museums collections management. Hopefully the IMLS will fund research for creating non-proprietary software based on the Archivist Tool Kit and with a more robust component that can describe museum materials.

The third criterion of technological advances will come from collaborations between museums and nonprofit organizations working to develop new open source archival tools and techniques. At the onset of this dissertation, I set out to prove whether it was wise for museums to collaborate with large, corporate technology entities and software companies in developing standardized technologies to conserve variable, digital, Internet, and time-based works of art. Although nonprofit collaborations will be de rigueur for building an archive, even required for IMLS funding, my research has proven that collaborating with technology companies is strongly discouraged.

There is a compelling need for technological research in museum conservation studies: existing emulation software is too young and unreliable to preserve our cultural heritage, and encapsulation technologies are still in their infancy. Although this crucial research rests on the financial support and infrastructure that a large technology company could offer, art, while sexy for large corporations, is idiosyncratic and individual. Even though leveraging a partnership with an arts institution can be a way for companies to gain recognition and human-interest appeal, corporations would have minimal benefits from involvement in such a small-scale and individualized project. From the museum’s perspective, if commercial interest gains power it is sure to create an unhappy
marriage. Moreover, the software that is developed needs to be open source and the only way the corporations could ever benefit from interdisciplinary collaborations would be by creating proprietary software whose codes and the rights are owned by the corporations.

Proprietary software is useless for preservation in the art world because it is tied to the market and industry. Since new media art preservation relies on technology that is always changing, collaboration with a corporate partner would have to be long-term and continually evolving for the corporation to see any benefits. Regardless, new media conservation still needs tech research; Nick Hasty believes that there is a business opportunity in “designing software that helps to standardize how new media art is archived or facilitate how new media art is presented (i.e. emulation software).”164 However, he agrees it is not going to come from the technology corporations; rather it will be the work of nonprofits.

Nonprofit art and technology collaborations have been proposed in the past. As early as 1966, modern art curator Maurice Tuchman developed an Art and Technology program out of the Los Angeles County Museum of Art conceived to “bring together the incredible resources and advanced technology of industry with the equally incredible imagination and talent of the best artists at work today.”165 In 1967, Robert Rauschenberg formed an organization called Experiments in Art and Technology aimed “to catalyze active involvement of industry, technology, and the arts.”166 It is even true “that technological advances have come from some of the artists who have probed the uses of media in their

164 Nick Hasty interview, August 2009.
165 Goodman, Digital Visions, 40.
work.”  

Photography and video technologies were both improved when artists began experimenting with them as art forms. “Because the medium often lags behind the concepts that artists try to communicate, they must often push the boundaries or develop technologies to express their ideas.”

“What are the principles, economic incentives and contractual relationships that might serve to create an environment most conducive to the preservation of digital information into the indefinite future?” Considering the lack of funding, any way to create consortia and partnerships is a beneficial situation. A collaboration could materialize in a relationship between smaller museums and the independent organizations mentioned in chapter five, who are doing great research but do not have collections themselves to preserve. Small museums need the preservation technology, strategies, and standardized language just as urgently as do larger institutions, but are not capable of putting the resources or manpower behind research and development. Businesses who work specifically for arts institutions can contract out this technical assistance, reformat their collections, and house their works of art on a server, while taking the artistic concerns into consideration.

One practical model is Rhizome, a platform for new media founded in 1996 through the New Museum of Contemporary Art in New York. “Its mission

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168 Ibid, 67.
is to support contemporary art that uses new technologies in significant ways."\footnote{170}

It is one of the most active and effective organizations for preserving new media. Not only does its capacity as an adjunct program to the New Museum allow hosting of works on the New Museum server, thereby preserving access by being able to control their own site, but also Rhizome archives the works and stores archival metadata. Rhizome operates through an archive system called ArtBase, which retains 2,503 digital artworks, and its counterpart, TextBase containing texts that pertain to these artworks. Artists upload their web-based works onto the site, retain ownership and all rights, “and Rhizome is given a non-exclusive, worldwide, royalty-free, fully paid-up license to store copies of their artwork on [its] servers, to include their artwork in the ArtBase and to perform, display or otherwise make available their artwork to users online.”\footnote{171} Some works are hosted on the artist’s local server but Rhizome links to the work on their site. As the New Museum looks to shift into collecting, ArtBase is being redesigned as Rhizome attempts to build an emulation solution in order to keep every work in their potential collection up to date.

Runme.org is a very important model for software art because it recognizes that since the medium of software never stabilizes, “the exhibition is a process, not an end point.”\footnote{172} Unlike the curatorial review that happens on Rhizome, Runme.org is self-organized so submissions do not have to be authorized, and institutional recognition is not a factor, similar to the Open Art

\footnote{170}Forging the Future website. http://forging-the-future.net/
\footnote{171}Nick Hasty, interview August 2009.
\footnote{172}Dietz, “Curating Net Art,” in New Media in the White Cube and Beyond, 79.
Network. The free exchange between artists creates contexts for this new form of cultural activity.\textsuperscript{173}

Effective integration of the three support functions of education, standardization, and technology, to enable an archive that mimics the models of Rhizome or Runme.org, will enable museums to viably collect and conserve digital, time-based, Internet, and variable artworks, validating and preserving these works into the indefinite future and creating a more lucid framework for their market and value.

\textsuperscript{173} Ibid, 78.
Conclusion

The landscape of museum collection and conservation has drastically changed in light of artists’ continued exploration of electronic, time-based, variable, digital-born, and Internet art. These new media “have confounded traditional museological approaches to documentation and preservation because of their ephemeral, documentary, technical, and multi-part nature and because of the variability and rapid obsolescence of the media formats often used in such works.” 174

The tendency to cast aside this art as ephemeral, subverting the museum system, and therefore, uncollectible is an easy excuse for museums not changing their traditional structures of conservation. “The intrinsic features of new media art ultimately protect it from being co-opted by the art establishment. Nevertheless, its integration is in museums’ own best interest: new media art constitutes a contemporary artistic practice that institutions cannot afford to ignore.” 175

Museums have helped shape the American experience in the past, and they have the potential to play an even more aggressive role in shaping American life in the future...They will have to reexamine and rethink some of the most fundamental assumptions they hold about what they do and how they do it. They will also have to reclaim the sense of bold entrepreneurship and experimentation that characterized the earliest days of the museum movement in America. 176

In 2010, as the influence of the critic’s voice weakens and the boom market activity subsides, the art world will become more conservative in its tastes

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175 Paul, New Media in the White Cube and Beyond, 74.
and new media art will be a more risky investment that collectors are less apt to take. The validating powers of museums are therefore integral to establishing a monetary, cultural, and historical value for contemporary art. “Future generations, no longer engaged by our art ‘concepts’ and unable to divine any special skill or emotional expression in the work, may lose interest in it as a medium for financial speculation and relegate it to the realm of historical curiosity.”177 Finding ways to conserve new forms of art, and retain context, inside accepted institutions such as museums will define what is culturally lasting and what is ephemeral.

But the fact is, time-based, Internet, digital, and variable art is here to stay and will probably only get more complex as artists incorporate yet unforeseen technologies. Therefore, collection, conservation, and establishment recognition must adjust. Since many of these works are mutable, the concept of the original is no longer relevant and the museum will need to evolve its conservation framework so that it can support many iterations of the same work. As art is characterized more by conceptual substance and less by aesthetics, it is important to reach beyond the visual in conservation goals. New media conservation requires multiple levels of support to preserve the integrity of the art: contextualization, updating, refreshing, recreation, archiving, communication, maintaining a platform and access to that platform, metadata collected from artists, and a new training for conservators. Museums need to adapt their policies and mindset to fit the art. If museums can combine current technologies with

177 Dutton, “Has Conceptual Art Jumped the Shark Tank?”
ongoing technology research, they can most certainly tackle the practical challenges of creating archives for their new media and continue to collect cutting-edge art. If the art world can begin to train conservators in a hybrid of skills, they can fix the lack of qualified manpower that is currently challenging museum conservation. And if museums partner with libraries and other institutions they can receive the necessary funding and awareness to implement this strategy and this new framework.

The conservation paradigm must change to meet the needs of new media art. Museums must work to adapt a new type of conservation process for this art that does not focus on material objects and authenticity of the original, but recognizes that these new media artworks evolve with time.
Images

Fig. 1. Sep Kamvar and Jonathan Harris, *I Want You To Want Me*, 2007, computer program and 56” high-resolution touch screen, Museum of Modern Art.

Fig. 2. Mark Napier, *Net.flag*, 2002, Internet Art Guggenheim Museum.
Fig. 3. Sol LeWitt, *Wall Drawing #1152 Whirls and Twirls*, 2005, Acrylic Paint, Massachusetts Museum of Contemporary Art.

image courtesy of Mass MoCA http://www.massmoca.org/lewitt/walldrawing.php?id=1152
Appendix A

The Accreditation Commission’s Expectations Regarding Collections Stewardship
Approved December 17, 2004
Effective January 1, 2005

The Accreditation Commission’s expectations reflect the evolving nature of standards and practices in museums. During its review of over 100 institutions a year, the Commission discusses how current practices in museums relate to the existing eligibility criteria and Characteristics of an Accreditable Museum. These Expectations support and elaborate on the Characteristics of an Accreditable Museum. Periodically, after thorough deliberation, the Commission revises its expectations to stay current with evolving standards. The Commission focuses on presenting desired outcomes, rather than on prescribing methods by which these outcomes must be achieved.

Why does the Commission consider collections stewardship important?
Stewardship is the careful, sound, and responsible management of that which is entrusted to a museum’s care. Possession of collections incurs legal, social, and ethical obligations to provide proper physical storage, management, and care for the collections and associated documentation, as well as proper intellectual control. Collections are held in trust for the public and made accessible for the public’s benefit. Effective collections stewardship ensures that the objects the museum owns, borrows, holds in its custody, and/or uses are available and accessible to present and future generations. A museum’s collections are an important means of advancing its mission and serving the public.

What are the Accreditation Commission’s expectations regarding collections stewardship?
Per Program Eligibility Criteria:
- An accredited museum, either collecting or non-collecting, is required to have a formal and appropriate program of documentation, care, and use of collections.
- An institution that owns collections (including living organisms), whether actively collecting or not, is required to have accessioned at least 80 percent of its permanent collections.

1 First issued by the Accreditation Commission in June 2001. This revised version supersedes the 2001 version.
2 See Glossary at the end for definitions of bolded terms.
Per the Characteristics of an Accreditable Museum, an accreditation museum must demonstrate that it:
- owns, exhibits, or uses collections that are appropriate to its mission
- legally, ethically, and effectively manages, documents, cares for, and uses the collections
- conducts collections-related research according to appropriate scholarly standards
- strategically plans for the use and development of its collections
- guided by its mission, provides public access to its collections while ensuring their preservation
- allocates its space and uses its facilities to meet the needs of the collections, audience, and staff
- has appropriate measures in place to ensure the safety and security of people, its collections and/or objects, and the facilities it owns or uses
- takes appropriate measures to protect itself against potential risk and loss

The Commission also expects an institution to:
- plan strategically and act ethically with respect to collections stewardship matters
- legally, ethically, and responsibly acquire, manage, and dispose of collection items as well as know what collections are in its ownership/custody, where they came from, why it has them, and their current condition and location
- provide regular and reasonable access to, and use of, the collections/objects in its custody

This requires thorough understanding of collections stewardship issues to ensure thoughtful and responsible planning and decision-making. With this in mind, the Commission emphasizes systematic development and regular review of policies, procedures, practices, and plans for the goals, activities, and needs of the collections.

How does the Commission assess whether the institution’s collections and/or objects are appropriate for its mission?
The Commission compares the institution’s mission—how it formally defines its unique identity and purpose, and its understanding of its role and responsibility to the public—to two things:
- the collections used by the institution, and
- its policies, procedures, and practices regarding the development and use of collections

(See also the Accreditation Commission's Expectations Regarding Institutional Mission Statements.)
the museum regularly monitors environmental conditions and takes pro-active measures to mitigate the effects of ultraviolet light, fluctuations in temperature and humidity, air pollution, damage, pests, and natural disasters on collections

- an appropriate method for identifying needs and determining priorities for conservation/care is in place

- safety and security procedures and plans for collections in the museum's custody are documented, practiced, and addressed in the museum's emergency/disaster preparedness plan

- regular assessment of, and planning for, collection needs (development, conservation, risk management, etc.) takes place and sufficient financial and human resources are allocated for collections stewardship

- collections care policies and procedures for collections on exhibition, in storage, on loan, and during travel are appropriate, adequate, and documented

- the scope of a museum's collections stewardship extends to both the physical and intellectual control of its property

- ethical considerations of collections stewardship are incorporated into the appropriate museum policies and procedures

- considerations regarding future collecting activities are incorporated into institutional plans and other appropriate policy documents

The Commission also reviews the following documents required to be submitted as part of the accreditation process:

- Repository agreement for objects in custody without title (required for some museums)

- Visual images that illustrate the scope of the museum's collections

- Collections management policy and loan policies (custodial care and borrowing policies for museums that do not own or manage collections, but borrow and use collections for exhibits, education, or research)

- Sample copy of completed collections documentation record(s) (with accession, catalog, and inventory information)

- If the museum is authorized to deaccession, a copy of a deaccession form or other written documentation used for deaccessioning purposes (a completed form if applicable, otherwise a blank form)

- Sample copy of a completed outgoing loan agreement

- Sample copy of a completed incoming loan agreement

- Sample copy of completed condition report form

- Emergency/disaster preparedness plan (covering staff, visitors, and collections)

In addition, the following documents are not required but should be provided if available:

- **Collections plan**

- Conservation plan

- Completed RC-AAM **Standard Facility Report**
In its review, the Commission examines whether:

- the mission statement or collections documents (e.g., collections management policy, collections plan, etc.) are clear enough to guide collections stewardship decisions
- the collections owned by the museum, and objects loaned and exhibited at the museum, fall within the scope of the stated mission and collections documents.
- the mission and other collections stewardship related documents are in alignment and guide the museum’s practices.

How does the Commission assess whether the institution effectively manages, documents, and cares for its collections and/or objects?

The Commission recognizes that:

- there are different ways to manage, house, secure, document, and conserve collections, depending on their media and use, the museum’s own discipline, size, physical facilities, geographic location, and financial and human resources.

Therefore, the Commission considers many facets of an institution’s operations that taken together, demonstrate the effectiveness of its collections stewardship policies, procedures, and practices. The Commission considers the museum’s collections stewardship policies, procedures, and practices in light of these varying factors.

- museums may have diverse types of collections categorized by different levels of purpose and use—permanent, educational, archival, research, study, to name a few—that may have different management and care needs. The Commission expects these distinctions to be articulated in collections stewardship-related policies and procedures.

- different museum disciplines may have different collections stewardship practices, issues, and needs related to their specific field. The Commission expects museums to follow the standards and best practices appropriate to their respective discipline and/or museum type as applicable.

In its review, the Commission expects that:

- a current, approved, comprehensive collections management policy is in effect and actively used to guide the museum’s stewardship of its collections
- 80 percent of the permanent collection is formally accessioned and an appropriate and reasonable percentage of the permanent collection is cataloged, inventoried, and visually documented
- the human resources are sufficient, and the staff have the appropriate education, training, and experience, to fulfill the museum’s stewardship responsibilities and the needs of the collections
- staff are delegated responsibility to carry out the collections management policy
- a system of documentation, records management, and inventory is in effect to describe each object and its acquisition (permanent or temporary), current condition and location, and movement into, out of, and within the museum
Glossary

Accessioning: a) Formal act of accepting an object or objects to the category of materials that a museum holds in the public trust. b) The creation of an immediate, brief, and permanent record utilizing a control number for an object or group of objects added to the collection from the same source at the same time, and for which the museum has custody, right, or title. Customarily, an accession record includes, among other data, the accession number; date and nature of acquisition (gift, excavation, expedition, purchase, bequest, etc.); source; brief identification and description; condition; provenance; value; and name of staff member recording the accession.

Care: The museum keeps appropriate and adequate records pertaining to the provenance, identification, and location of the museum's holdings and applies current professionally accepted methods to their security and the minimization of damage and deterioration.

Collections: Objects, living or nonliving, that museums hold in trust for the public. Items usually are considered part of the museum's collections once they are accessioned. Some museums designate different categories of collections (permanent, research, educational) that functionally receive different types of care or use. These categories and their ramifications are established in the museum's collections management policy.

Collections management policy: A written document, approved by the governing authority, which specifies the museum's policies concerning all collections-related issues, including accessioning, documentation, storage, and disposition. Policies are general guidelines that regulate the activities of the organization. They provide standards for exercising good judgment.

Collections plan: A plan that guides the content of the collections and leads staff in a coordinated and uniform direction over time to refine and expand the value of the collections in a predetermined way. Plans are time-limited and identify specific goals to be achieved. They also provide a rationale for those choices, and specify how they will be achieved, who will implement the plan, when it will happen, and what it will cost.

Objects: Materials used to communicate and motivate learning and instruments for carrying out the museum's stated purpose.

Standard Facility Report: A standardized form developed by the AAM's Registrar's Committee (RC-AAM) to expedite the exchange of information critical to lenders and insurers. Museums fill in information about their physical specifications, and policies and procedures related to environmental controls, fire protection, security, handling/packing, and loans. Available only through purchase from the AAM Bookstore.
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