## Preservation Practices of New Media Artists: Challenges, Strategies, and Attitudes in the Personal Management of Artworks

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**Abstract:**

**Purpose:** The purpose of this paper is to investigate the preservation practices of new media artists, in particular those working outside of the scope of major collecting institutions, examining how these artists preserve new media artworks in their custody. **Design/methodology/approach:** The paper builds case studies of seven new media artists of differing practices and artistic approaches. For each case study, semi-structured interviews with the artists were conducted in conjunction with visits to the artists' studios. **Findings:** The study finds that new media artists face a number of shared preservation challenges and employ a range of preservation strategies, and that these challenges and strategies differ markedly from that of art museums and cultural heritage institutions. **Research limitations/implications:** This study considers preservation practices for new media artists generally. Further research into specific communities of artistic practice could profitably build upon this overall framework. **Practical implications:** The findings of this research pose a number of implications for art museums and cultural heritage institutions, suggesting new ways these institutions might consider supporting the preservation of new media artworks before works enter into institutional custody. **Originality/value:** The literature on new media art preservation emphasizes the importance of working with artists early in the life cycle of digital artworks. This study advances this by investigating preservation from the perspective of new media artists, deepening the understanding of challenges and potential preservation strategies for these artworks prior to entering or outside of institutional custody.

**Keywords:** Archives | Personal information management | Digital preservation | Personal digital archiving | Art conservation | Artist archives | Artist information behaviour | Digital art | New media art

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## 1. Introduction

New media art constitutes a significant vein of contemporary artistic production, with many artists creating culturally significant artworks that critically investigate the meanings and uses of technology in the contemporary moment. Yet countless such works have been lost from the

cultural record, with even more rapidly becoming inaccessible. For the past several decades, advances in technology have radically altered daily life, with the computer especially persisting as a deep and active force in the cultural imaginary. Artists respond to this present technological landscape through experimentation, play, and critical inquiry, creating artworks that push the boundaries of hardware and software, and forge connections across the digital and the analog. These works exist at the bleeding edge and often have a short lifespan. The preservation of more "standard" digital objects is already a difficult undertaking, complicated especially by the rapid rate of obsolescence of hardware and software programs (Hedstrom, 1997); these preservation concerns are only exacerbated where highly unique and complex objects such as technology-based artworks are concerned.

These artworks help to elucidate how societies around the globe think about and interact with technologies, and thus constitute a significant component of contemporary cultural heritage. Just as art historians today look back to artworks of previous times to better understand these earlier eras, so too will today's new media artworks speak for the present moment. Cultural heritage institutions, museums in particular, are typically responsible for preserving these materials, and have increasingly begun to collect new media artworks; however, many challenges persist in the collection of these works. As Graham (2014) points out, "the collecting of new media forces institutions to redefine many core categories, including not only questions of what is collected, but also "the modes or ways of working for those involved in the collecting process" (p. 2). The work of curators, conservators, and even the audience, must change with the collection of new media art.

While there exists a growing body of literature devoted to the preservation of new media artworks in institutional collections, a great many such artworks remain uncollected, and thus without the benefit of the resources and preservation know-how afforded to artworks within major collections. While it is not in the purview of collecting institutions to actively preserve all or even most new media artworks, it is in the interest of cultural heritage at large to better understand the preservation challenges and strategies of new media artworks in the custody of artists. To date, much of the research has been driven by concerns over artworks in institutional collections, and consists largely of case studies detailing how particular artworks have been preserved. The area of new media art preservation continues to develop, driven by the pursuit for more systematic and scalable approaches, but these efforts must be supported by empirical research that looks beyond individual cases and seeks to describe the overarching themes, concerns, and concepts (Innocenti, 2014) – nor can this broader research program focus only on the institutional perspective at the expense of preservation issues experienced by artists working outside of the scope of major collecting institutions.

I want to address this by posing the following questions:

> *RQ1.* How do new media artists conceive of the preservation of their artworks?
>
> *RQ2.* Do preservation concerns arise in the process of creation?
>
> *RQ3.* How do preservation challenges manifest in the ongoing maintenance of an artwork?

The answers to these questions have serious implications for both institutional and artist-driven preservation of new media works. An increased body of knowledge of artists' concerns, conceptions, and practices in the preservation of their own artworks should serve to inform institutional strategies and approaches. Existing research stresses the importance of the collaboration between artist and institution, and this dialogue already forms a key component of many existing preservation approaches (Depocas *et al.*, 2003; Laurenson, 2004); this study contributes to this discourse by adding empirical information about artists' preservation challenges early in the life cycle of the artwork. We must also be able to recognize where institutional and artists' perspectives diverge on the issue of preservation. While institutions are prone to think in terms of rendering a particular object durable over time, artists may intentionally allow works to deteriorate, or employ creative strategies actively dismantling previous works to fuel the creation of new works. A deeper understanding of how to preserve new media artworks will make it easier for a wider range of institutions to collect and maintain new media works in their holdings – or to develop alternative strategies for collecting and documenting significant new media artwork that do not necessarily involve the custodial transfer of an object (or set of objects) from artist to institution.

## 2. Challenges of preserving new media art

Museums and other visual art institutions began to comprehensively diagnose digital preservation concerns in the 1990s. The seminal study *Time & Bits: Managing Digital Continuity* (Davis and MacLean, 1999) addressed growing concerns regarding cultural heritage materials stored on digital media, which to this point lacked plans for long term for preservation. Among this diverse body of digital materials, new media art objects were identified as a special case (Besser, 2001). Besser establishes that new media artworks are radically different from analog artworks, such as paintings and sculptures. While these analog artworks persist rather durably over time, new media artworks lack fixity, often involve audience interaction, and depend on particular hardware and software configurations. The aesthetics and behavior of a new media artwork emerge out of a complex ecology of devices, programs, and technological infrastructures, such that these artworks resemble performance art and installation art more so than an easily circumscribed art object like a painting. Chiantore and Rava (2012) distinguish performance, installation, conceptual, and new media art as special cases requiring radical preservation strategies qualitatively different from analog artworks. While contemporary paintings and sculpture require physical treatments, such as the application of chemical solutions, preservation of new media art often focuses on the maintenance of the idea or the experience behind the work.

As new media artworks consist of many interrelated digital components, and often involve interactive and dynamic aspects, they are characterized as "complex digital objects" (Anderson and Delve, 2014). Digital preservation strategies that work for simpler digital objects, such as refreshing storage media or migrating objects to new file formats, have to be seriously modified or specialized to preserve complex digital objects. Without special considerations, these preservation strategies could potentially obscure, alter, or efface aspects of the original new media artwork that are critical to its functioning and meaning. Magruder (2014) outlines a number of ways that new media artworks exhibit complexity and raise difficult questions for

digital preservation, including the incorporation of live data streams, combining digital and analog components, spanning different virtual and networked spaces, and integrating collaborative content. Laurenson (2004) addresses a further aspect of new media art's complexity: dependencies on particular pieces of hardware and display equipment. A piece of new media art may originally run through a specific video projection system or run on a specific model of a computer. If the meaning and behavior of the work is tied to this original running environment, then the preservation of installation and display equipment must also be considered. The Inside Installations project (Scholte and Wharton, 2011) also addressed these concerns, and sought to develop long-term preservation strategies for new media installation artworks.

## 3. Current approaches to preserving new media art

As a complex digital object, the preservation of a new media artwork is never about the management of a single digital file, but rather a set of relations and interdependencies among a diverse group of component parts. Besser and Laurenson both recommend that curators and conservators work directly with the artist to clearly define which characteristics and components constitute the essence of the artwork, and which characteristics and components are peripheral to the artwork. Museum professionals and artists can then work together to plan appropriate preservation measures for an artwork. This approach to new media art preservation was further pursued by the pioneering Variable Media Network, which was founded in 2000 by a consortium of art institutions including the Guggenheim Museum, Rhizome.org, and the Walker Art Center (Depocas *et al.*, 2003). The group defines this approach to new media art preservation as the variable media paradigm, in which museum professionals encourage "creators to define their work independently from medium so that the work can be translated once its current medium is obsolete"[1]. Artists can define acceptable ways for their works to be re-created for new platforms, hardware, software, and media types, so that while some aspects of the work may change, the underlying essence of the original artwork will persist in these new incarnations. Ippolito and Rinehart (2014) have continued to refine the variable media approach to new media art preservation, positing re-interpretation of a defunct work as a viable preservation strategy in addition to storage of original components, migration to new formats, and emulation of obsolescent hardware and software on current machines.

In addition to technical preservation approaches like migration and emulation, art information professionals have developed methods for documenting the performative and experiential aspects of new media and installation artworks (Jones, 2007). Boutard (2016) has also advocated documentation as a means for preserving a rich and multi-agent record of electronic music performances. Documentation can serve as an ongoing record of an artwork if preservation efforts have failed; but documentation can also inform preservation efforts, providing insight into how an artwork originally functioned. Innocenti (2014) has suggested that documentation can serve as a means for custodians to maintain the provenance of new media artworks. Even if conservation efforts and other conditions have altered some aspects of the artwork, the documentation can track and explicate these changes. In order to stay alive, digital artworks must stay in a "state of evolution" (p. 82), which is all the more reason for trusted documentation schemes to authentically narrate the dynamic life of a digital artwork.

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[1] http://variablemedia.net/e/index.html

**4. Advocating artist-driven preservation efforts**

The existing literature on the preservation of digital and new media artworks routinely advocates for the need to include the artist in the preservation process, and to work with artists at all points in the life cycle of the art object. As Anderson and Delve (2014) suggest, "it is clear that artist, technology provider and curator need to work together right from the earliest moments of a commissioned software art's work's life to ensure that steps are in place for its long term preservation" (p. xl). However, there remains a paucity of research that meets this need by directly investigating digital preservation concerns earlier in the life cycle of the artwork, such as at the point of creation or when the artwork is still maintained by the artist. Much of the existing research, including work cited above, attends to preservation challenges and practices at moments in the life cycle in which the new media artwork intersects with institutions, museums, and arts organizations. But what of preservation concerns for artworks that never enter into institutional care? This represents a serious gap in the literature of new media art preservation. Biggs (2014) points out that "most digital artwork produced is never likely to be collected, privately or institutionally" (p. 24). Without preservation efforts and research occurring outside of the small subset of institutionally collected new media works, nearly all of this work will not only be inaccessible, but by and large undocumented and forgotten.

Innocenti (2014) draws attention to another serious gap in the literature of new media art preservation: the lack of systematic and theoretically grounded research efforts. The research to date has largely been driven by specific case studies and the immediate concerns of collecting institutions. While this body of research has demonstrated many of the pressing concerns of new media art preservation, and has presented some tenable solutions for particular works, theoretical and methodological grounding is necessary if the field of new media art preservation is to establish widely applicable terms, concepts, and approaches (Noordegraaf *et al.*, 2013). Taken together, Innocenti and Biggs clearly demonstrate a need for more systematic research into the digital preservation concerns and practices of new media artists whose work exists outside of major collections.

**5. Methods**

The theoretical approach that I use in this study is media archeology. Media archeology seeks to position technological devices as both material and cultural objects imbued with rich intellectual histories. Applied to the study of cultural heritage materials, media archeology investigates the technologies used to produce, preserve, and access cultural objects, in addition to considering the content of works like films, books, websites, or artworks. Although Huhtamo and Parikka (2011) stress that media archeology encompasses a diverse set of practices, they also argue that the field can be defined by a common approach to media technologies, placing these in a particular historical context and working against universalizing and homogeneous narratives of the development and uses of technology. While much of the work in the area of media archeology has been historical in focus, media archeology can be increasingly seen as a "concrete activity, as a material engagement with (technological) devices or apparatuses" (Strauven, 2013, p. 66). This approach has wide applicability for a deeper understanding of the digital creativity of content creators both past and present. Kirschenbaum (2008), for instance,

uses a media archeological approach to investigate the role that digital storage technologies have played in the creation and dissemination of important works of electronic writing.

This approach also has applicability for research into preservation activities. New media artists use a variety of technologies and establish sets of creative practices, each of which provide the artists with distinct affordances and possibilities – but also limitations. An artist might use a software program to achieve a desired effect, but the end product may be difficult to preserve as a result of using that particular program. The digital tools used may also shape how artists store and manage files over time, which also has preservation implications. By grounding my research in a media archeological approach, I focus on the tools and practices employed by artists, investigating the continued impact of these choices on the life of the artwork, and the ways in which digital preservation conceptions and concerns influence these technological interactions. This theoretical approach will help to ground my observations and my line of questioning, and will also provide a systematic and reproducible frame of analysis.

To this end, media archeology as a theoretical framework suggests some possible future trajectories for new media art preservation research. Developing a systematic means for characterizing how new media artists in the present use specific pieces of hardware, software, and other technologies can inform recovery projects for artworks lost to time, or nearly so. As Biggs (2014) suggests, new media works of the not-too-distant past will soon require not art historians, but archeologists, to make sense of them. Knowledge gained from a media archeological analysis can also be leveraged to guide future digital preservation actions; with a growing body of new media art conservation practices, an understanding of how an artwork was created out of particular technological interactions can be used to anticipate potential problems before they arise and incur irrevocable loss.

In order to explore the digital preservation challenges faced by new media artists, I have conducted case studies of seven new media artists working outside of major collecting institutions. As the preservation concerns of new media works outside of collecting institutions is a largely unstudied area, the case study research design was chosen as a method to gather rich and in-depth data in order to elucidate the core concepts, themes, and variables necessary for further programmatic research. As new media artists often work in highly idiosyncratic ways, the concentrated focus of the case study design is also well suited to capture the particularities of subjects in this population.

I employed the snowball sampling method to select cases for this research (Wildemuth, 2009, p. 121). Starting with two new media artists in my acquaintance, I asked these individuals to put me in contact with additional new media artists. As new media artists often have unique creative practices and outputs, I expected to elicit a variety of preservation concerns and approaches from this relatively small sample. This expectation was born out, and I was able to collect a diverse body of data through these seven case studies. While the data gathered from these case studies characterizes existing preservation challenges and approaches, a limitation of this research design is that these specific cases do not necessarily apply to the population of all new media artists. Further research in this area with a more extensive sample could build upon these initial findings.

For each case study, I used a mixed method design for data collection, employing semi-structured interviews, direct observation of each artist's studio space, and gathering of a variety of documents and artifacts. Artists' creative activity often does not follow a predictable pattern, and these methods allowed me to collect data about each artist's preservation concerns and practices without having to directly observe the artist in the act of creating or maintaining an artwork. The semi-structured interviews took place in the artists' studios, and occurred concurrently with a period of direct observation of the studio space and the gathering of artifacts. I recorded audio for all of the interviews using a digital recording device. Two of the artists were non-local, and I adapted this procedure by conducting interviews via a webcam. Although webcams present some additional challenges, such as the possibility of technology failure, King and Horrocks (2010) suggest that webcams are an increasingly viable option for distance interviews. In all of the cases, the artist's studio included a variety of physical and virtual spaces, including designated rooms with materials and supplies as well as the artist's computer.

At the start of the interview, I asked the artist to walk me through his or her studio and describe his or her creative practices. I encouraged the artist to discuss specific artworks, materials, and techniques throughout this initial walk through. As the artist touched on these specifics, I asked the artist to detail any preservation challenges and approaches he or she had encountered with each item. Following the studio walk through, I asked the artist more broadly about the preservation concerns that cut across his or her creative practices. The two studio visits conducted over webcam did not differ markedly from the in-person visits. Both of these artists used laptops with webcams, and so had the ability to move the camera around their studio spaces. They used the webcam to give me both an overall sense of their studio spaces and to direct my attention to specific items. In addition to the interview, I also made observations, and collected documents, artifacts, and took photographs as permitted by the artist. For the webcam interviews, I took screenshot captures for any aspects of the studio that I wanted to document in visual form, also by the artist's permission. In all of the cases, I conducted a single studio visit, although I had occasion to send follow up questions to several of the artists via e-mail. After analyzing the data and producing an initial draft of each case study, I used member checking with each artist to bolster the validity and credibility of my findings.

Following the studio visits, I transcribed the audio recordings of the semi-structured interviews. I coded and analyzed these transcriptions using qualitative data analysis software. My coding process was iterative, involving several passes over all of the transcriptions as I refined the codes and organized them into a system of families. Although these interviews generated a wealth of data that fell outside of this scope, I used my stated research questions to direct the development of my coding scheme. This process resulted in eight families: general attitudes regarding preservation, preservation challenges and concerns, factors for preserving a work, factors for decommissioning a work, proactive preservation strategies (those employed to anticipate a preservation challenge), retroactive preservation strategies (those employed after a challenge had arisen), storage practices for artworks, and personal archiving practices for documentation or other materials supplementary to artworks. I used the qualitative data analysis software to compare across the seven cases, identifying challenges, strategies, and attitudes shared by the artists as well as those unique to specific artists. I further refined the initial eight code families into the following four core categories: preservation challenges, preservation strategies, preservation attitudes, and personal archiving practices.

Due to the nature of my sampling method and the limited sample size, five of the seven artists are concentrated in one geographic region. As the range of contemporary artists' engagement with technology is incredibly vast, these seven cases will only speak to a slim section of that variety, and further research will be necessary to bear out and expand upon the findings of this study. Despite the limitations of the study, these cases demonstrate a core set of categories and themes, broadly descriptive of the preservation practices of new media artists, and can be used to structure further research into new media artists' custody and care of their artwork (Table I).

**Table I.** Overview of artist case studies

| Artist | Artistic practice | Factors in maintaining or decommissioning works |
|---|---|---|
| Hugo Arcier | Still image prints, digital video, and installations made from 3D computer generated objects | Keeps materials for all past projects for potential sale, re-exhibition<br>Highly values having an archive of his body of work |
| Kellie Bornhoft | Kinetic sculptures powered by micro-controllers | Re-exhibition is the main factor for keeping a work<br>Size concerns, and the capacity to re-uses parts for new work are factors in decommissioning |
| Stacey Kirby | Performative and interactive installations | Maintains thorough documentation in personal archive, which can be used to recreate works |
| Daniel Smith | Sculpture made with CNC machining; virtual reality (VR) sculptures | Corruption or loss of digital files force works into decommissioned status |
| Lile Stephens | Sculpture and installation made with re-purposed electronics | Emphasizes process over discrete artworks<br>Re-uses materials for new works |
| libi rose striegl | Research-based practice investigating meanings and uses of technology | Not interested in maintaining artworks as fixed, discrete objects<br>Shares digital objects freely online and gives away analog artifacts<br>Re-uses materials to create new works |
| VECTOR (Leah Wilks and Jon Haas) | Large-scale multimedia dance performances | Main factor for saving materials from performances is to support the pursuit of professional opportunities like grants and future shows |

## 6. Artists' preservation practices

6.1 Preservation challenges and strategies

In many ways, the preservation challenges that the artists discussed align with those challenges already thoroughly outlined in the existing literature on new media art preservation. Several

artists described the complexity of artworks as a serious impediment to their long-term preservation. This was a concern for kinetic sculptures created by Bornhoft and Stephens, which involve many moving parts and intricate combinations of mechanical, electrical, and electronic components. As Stephens expresses, the complexity of an artwork can inhibit the work from being exhibited more widely or enduring over time:

> I don't really have a good approach for how to package it, how to have the right instructions, repair options and things. Mainly because I don't know if they're going to work, but also because I haven't taken the time to ensure that they will work over a period of time.

The complexity of Stephens' sculptures requires that he be present for exhibitions in order to keep them functional, and limits the extent to which he can envision these works enduring over the long-term and outside of his custody.

Complexity was also an issue for the large-scale performance and installation works created by Kirby, VECTOR, and striegl. For these artworks, interactivity is a part of what makes the work complex, as audience participation becomes another component that must be considered as part of the overall work. For artists working with computer graphic imaging and virtual reality (VR) like Smith, complexity is also an issue because even a single artwork exhibited in Paper-Thin, the VR gallery run by Smith, is composed out of several digital files, all of which are necessary to experience the work:

> There's no "file" that's Paper-Thin. There's models, and those models have multiple different versions of themselves. There's a Maya, then there's an .OBJ or .FDX […]. Then there are also scripts that are associated with those within Unity, which has its own files. Those basically create the experience.

As these examples illustrate, complexity is a pervasive preservation challenge across different kinds of art making practices. Broadly, "complex" artworks are those that require the integration of a number of heterogeneous components in order to function. However, complexity can lead to many different kinds of preservation challenges depending on the kind of artistic practice, and might include interfacing analog and digital components, incorporating audience interaction or other dynamic performative elements, and managing digital objects composed of many discrete digital files (Laurenson, 2004).

By and large, documentation was the main strategy that artists used to preserve complex works; or, if not to preserve the original artwork, documentation served as a means to create a more easily manageable surrogate for a complex work. For Kirby, documentation explicitly functions to facilitate the re-exhibition of her complex and interactive installation pieces. As Kirby continues to re-exhibit her work, *The Power of the Ballot*, she uses a combination of written instructions and photographs of past exhibitions to make sure that she is installing the piece correctly: "these are the steps for putting it together. I did this for documentation so I could put it together in the future because [Christian, a collaborator,] is not going to be there every time, although I wish he could be." In this case, documentation externalizes otherwise internal knowledge and renders it in a form that can be readily archived and accessed at a later time. In a

similar way, Bornhoft, Stephens, and striegl create schematics for artworks involving electronics. striegl also discussed the importance of annotating any code that she writes, although this is as much for her benefit – to be able to return to code and understand what it is supposed to do – as it is for other users accessing and downloading the code she shares through open access repositories like GitHub. Boutard and Guastavino (2012) describe a related concept of the "significant knowledge" required to re-perform electroacoustic musical works, which encapsulates the knowledge involved during the creative process that is required to understand, and thus re-perform, a complex musical work involving multiple technological and human-driven components.

Documentation is an essential strategy for both artists and collecting institutions to preserve interactive, performative, and otherwise complex artworks (Abbott, 2014). Abbott outlines a number of documentation models used by institutions to aid in the preservation of artworks in their collections, such as the MANS model mentioned above (Rinehart, 2007) and the Documentation and Conservation of Media Arts Heritage (DOCAM) documentation model[2]. Abbott emphasizes that these models can usefully guide artists' preservation activities, and facilitate collaborative preservation efforts between artists and institutions. However, the artists in this study did not use any standard documentation model, but instead employ idiosyncratic approaches to documentation, developed in step with their creative and exhibition practices. More comprehensive models such as MANS and DOCAM could prove to be beneficial tools for artists working outside of major collecting institutions, such as the artists in this study, but clearly there is a disconnect between these artists and documentation tools generated by institutions, arts organizations, and information professionals. Artists that do not work directly with these institutions may not be aware of these models or may not know how to implement them. Further research might test the utility of these models to document artworks early on in the life cycle for artists working outside of major institutions. If this proves viable, institutions might move to make these tools more visible to a wider population of artists, for instance, through community training workshops, and thus improve the accessibility of these tools beyond those artists represented in their collections.

Obsolescence, or the loss of the means of access to part or all of a work, is another issue discussed in the existing literature on new media art preservation in the institutional context. While this concern was expressed by many of the artists, the threat of obsolescence was perhaps less dire from their perspective. Smith seems to be the most concerned with obsolescence, especially in terms of the means of access to VR works in spaces like Paper-Thin becoming obsolete. For Smith, the technical problems of obsolescence are intricately related to sustaining a community engaged with VR artwork, as without this invested group of practitioners issues of obsolescence would become insurmountable:

> […] it's a prisoner's dilemma or a tragedy of the commons. Is it worth really diving into this community or should I just be doing my own work? These are all problems that the VR art movement is facing. They're also not new and they can be overcome. Linux is an open source project that's way more complicated. There are many examples out there of getting past the barriers to entry.

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[2] http://docam.ca/

For Smith, actively working to foster a community of practice around VR technologies has become his primary preservation strategy to combat technical obsolescence. As the reference to the development and sustaining of Linux suggests, Smith sees a great potential in an open source model for maintaining the means for creating and accessing software-based art, although this strategy does require the involvement and engagement of a group of individuals. Stephens, striegl, and Bornhoft also actively seek out open source platforms and tools for their artistic activities.

Other artists recognized that components of a work could become obsolete over time, but either did not see this as a major concern or not a concern that had significantly impaired their creative process to date. Arcier mentioned that he had experienced a few minimal issues with aspects of older digital objects not rendering correctly as he transitioned to newer versions of Maya, the 3D modeling software that he uses, but these issues could always be easily corrected. Likewise, Haas noted an instance when he was unable to access an Adobe file in an older version of the Adobe creative suite, but this was only an inconvenience and not a real preservation challenge.

Related to obsolescence, corruption or deterioration of part or all of an artwork was an issue discussed by several artists, but again was not as much of a concern from the artists' perspective as it might be from an institutional perspective. In cases where corruption was seen as a distinct threat to preservation, artists responded to this challenge by choosing widely available materials or working in ways that facilitated the mass production of similar objects, such as Smith's choice to use CNC machining to reproduce digital forms in common analog materials like wood and metal. Similar to reproducibility, artists also responded to potential deterioration by creating works that could be translated across media and proliferated online through personal websites and social media platforms. For instance, Kirby scans many of the documents that participants generate by interacting with her installations, and then shares these scanned artifacts widely through her personal website. This serves the purpose of increasing access to the artwork, but in a way that also allows the informational content of the work to persist in a number of forms.

Perhaps obsolescence and corruption were less of a concern for artists because they are thinking of preservation on a different time scale than most collecting institutions, maintaining artworks for a few years as opposed to several decades or longer. These issues may also be less of a concern for artists because they are, on the whole, more interested in sustaining an ongoing creative process than maintaining single artworks. striegl held the position that obsolescence and deterioration are not concerns at all, and in fact objects should be allowed to decay, an attitude that will be discussed further below.

While these concerns are shared by artists and institutions, albeit to varying degrees, the most prominent preservation threats expressed by the artists were not issues that have been thoroughly discussed in the existing literature. These concerns, articulated by nearly all of the artists, were size and the non-salability of a work. These factors do not so much represent technical preservation challenges, but rather stem from limitations of the artists' storage capacities and financial resources. All of the artists studied have limited physical storage space, although this presents more of an issue for artists like Smith, Kirby, Stephens, and Bornhoft who create sculptural and installation works. The problem of limited storage gets compounded with the non-salability of much new media and installation artwork; as artworks accumulate in an artist's

studio space, with no real market among collectors or institutions to obtain this work, past works take up more and more space that could be used to produce and store recent works or works in process.

The artists responded to this challenge largely in two ways: creating modular objects that could collapse down, taking up less storage space; and re-using materials from old works to create new pieces. Bornhoft's practice of creating modular sculptures enabled her to store many past works and to maximize home storage space, fitting large and bulky artworks in tight crevices like underneath beds and at the backs of closets. This has allowed Bornhoft to hold onto and re-exhibit artworks that would have been decommissioned otherwise. As Bornhoft describes, "I'll try to keep it around for a year before I take it apart just in case. You never want someone to come back and ask for a piece, which has happened." However, an artist may not always have the incentive to store a work for re-exhibition or potential collection. As many of the artists studied found minimal interest from patrons and museums in purchasing or collecting their complex new media artworks, the component parts of an older work proved more valuable if they could be re-purposed to create a new work, a process which sustains the artists' creative processes and saves resources. striegl describes this ongoing process of re-use:

> Once I've built something, I'm not terribly precious about keeping that thing together. I will take it back apart and build the next thing. Once I documented the thing that I've made, I'll go to the next one. If I need to steal something out of the thing that I made last, then I will.

Overall, this speaks to an essential difference between the artists' perspectives of their artworks and an institutional perspective. Many of the artists have integrated decommissioning past works and re-using materials into their creative practices. This is partly a response to limited storage space and financial resources, but also demonstrates an emphasis on the creative process over and above the maintenance of discrete artworks. Rather, artists sustain personal archives of documentation and stores of mutable components that can be used to re-create past works as well as to create entirely new works (Table II).

**Table II.** Summary of preservation challenges and strategies

| Preservation challenge | Preservation strategy |
|---|---|
| Complexity | Documenting artworks through images, videos, and schematics<br>Documentation serves as surrogate of work and can be used to re-create complex works |
| Obsolescence | Fostering communities of practice around software, tools, and platforms |
| Corruption/Deterioration | Creating easily reproducible works<br>Translating works across media<br>Proliferating copies |
| Size/Storage | Creating modular, collapsible works |
| Non-salability of works | Re-using materials from old pieces to create new works |

6.2 Preservation attitudes

Distinct from preservation strategies, which I classify as specific courses of action taken by an artist to consciously bolster the durability of an artwork at the point of creation or to restore or a damaged work later on in its life cycle, preservation attitudes are the overall stance an artist takes regarding the long-term preservation of his or her artworks. These preservation attitudes are not necessarily mutually exclusive, as the same artist may have one attitude about a certain work but another attitude regarding other works.

Preservation-as-variability was an attitude I observed for several different artists. Akin to Ippolito and Rinehart's (2014) variable media approach, this attitude is characterized by an acknowledgment that there is a value in preserving individual artworks over time, but that individual artworks do not need to remain fixed in a particular material form for it to be preserved. Many of the preservation strategies that the artists employed conceptually fit with this attitude. New media artists, by virtue of the kinds of art they make and the creative processes they employ, are especially open to seeing works as variable, dynamic, and subject to transformation over time. Artists like VECTOR and Kirby create performance and installation works, which are necessarily time- and site-specific, so any kind of preservation for these artworks will require the work to be transformed in some measure. Kirby actively builds variability into her installations, defining the ideas that are essential to the piece but then outlining a number of different configurations that will realize those ideas.

Although VECTOR recognized that re-exhibition of their large-scale performances might be prohibitively resource intensive, they were open to re-staging a performance as long as it were re-created and influenced by the new context and community in which it would be performed. In practice, VECTOR has applied a variable approach to the re-performance of smaller scale works. Wilks discussed how a solo performance developed by VECTOR evolved as it was re-performed on a dance tour, and in turn recast as a piece of video art:

> It's become all of these different versions, and it is the same "work" at the base of it. It's the same moves. But because it's a solo I can let it be really malleable depending on who I'm working with. It's been cool to let go of it in that way and see it in so many different forms.

As VECTOR'S performances focus more on communicating an idea and less on a strictly regimented set of choreographed moves and media components, these works have variability built into them. This emphasis on art making as a process of communicating ideas was shared by nearly all of the artists and seemed to be a key characteristic of the preservation-as-variability attitude.

Preservation-as-non-issue was another attitude that several of the artists exhibited at different points, although this was the dominant attitude for only one artist: Arcier. Artists often cannot expend the time, energy, or financial resources to consider preservation, and so they bracket it off as a concern. In many cases, they have not experienced any significant, unexpected losses of artworks or other materials that would cause them to prioritize preservation. Decommissioning works is already a regular part of many of these artists' studio practice; losing individual artworks is often the norm, while preserving a work over time is the exception. Although this is often the normal course of affairs, nearly all of the artists I studied have still considered

preservation at some point, even if preservation was not a major concern during the creative process.

Arcier expressed, though, that he does not have any real preservation concerns for his work. For instance, when asked about whether he worries about files for past works becoming corrupt or inaccessible, he responded, "Not really because when a project is done, generally I don't have to use it again." Although Arcier does not have any real preservation concerns, he does place great importance on maintaining an archive of all of his past projects, taking care to keep these well organized and backed up. While Arcier clearly values maintaining his past works and the artifacts generated during the artistic process, this does not necessarily translate to a preservationist attitude. As Arcier uses a widely supported software program, saves his files in common formats, and practices good data management habits, he has perhaps prevented preservation challenges from arising – although this does not guarantee long-term preservation, as even popular software and systems can eventually become obsolete. These activities suggest that Arcier takes the long-term preservation of his works into account, even if he does not frame these activities explicitly as preservation strategies. A characteristic of the non-issue attitude seems to be an ambiguity for the artist about what would actually constitute the "preservation" of an artwork. Artists exhibiting this attitude were not necessarily preservation-averse, but just have not had the opportunity to think of their work in terms of long-term preservation. As Stephens commented:

> I think that looking historically, a lot of artists are that way. They don't really care. They didn't make it to think about how it would be preserved for the next generation. They made it because it was important – it had to exist.

If the non-issue attitude is characterized by ambiguity toward preservation, the anti-preservation attitude is characterized by a firm disavowal of preserving artwork beyond the point of its immediate exhibition or use. Several of the artists exhibited this attitude at different points, but this stance was the dominant attitude for only one artist: striegl. Central to this perspective is the notion that the material life of art object is integral to the aesthetic meaning of the work itself. The artwork does not have one fixed material state, but continues to "perform" over time, as the piece ages, changes, and transforms. Stephens chooses thrifty, readily available materials for his artworks, even though these will likely not hold up over time:

> Those kinds of things can be concerns for archivists, but I kind of delight in that. It's like the Duchamp perspective for *The Bride Stripped Bare for Her Bachelors* […]. He tries to argue that [when a glass pane in the work broke as a result of mishandling] it was on purpose. It's very much the same for me. Whatever happens to this, that's the artwork.

For striegl, the anti-preservation attitude can also overlap with the non-issue attitude. While she is not motivated to preserve her artworks, and considers the ephemerality of materials to be part of the aesthetic experience, she is also not necessarily opposed to another entity, like a collecting institution, investing in the long-term preservation of her artworks – she is simply not interested in undertaking preservation actions herself. However, striegl did not emphasize the collection of her work as a professional goal, nor would she want to have any further control over the

preservation of a work in an institutional collection. Discussing this scenario, striegl joked that she would send the institution a box of stuff and they could deal with it.

6.3 Personal archiving practices

Regardless of the artist's attitude toward preservation, every artist maintained a personal archive, indicating that the personal archive serves the artist in many facets of their professional and creative activities, supporting the creation of new work as much as maintenance or re-creation of past works (Vaknin *et al.*, 2013). In general, information professionals have increasingly recognized the importance of personal digital archives, which can serve a variety of functions for individuals, as well as the need to develop preservation strategies to ensure the longevity of these personal collections (Redwine, 2015; Wilson, 2016). Over the course of conducting the studio visits, I consistently recognized the importance the artists placed on their personal archives, finding that the artists studied tended to think of preservation less in terms of the maintenance of discrete artworks and more in terms of the archive of their entire body of work, including documentation, artifacts from the creative process, and stores of raw materials and components re-purposed from old works for the creation of new works. In terms of where and how materials are stored, both in the studio space as well as on digital storage media, artworks in the artist's custody can even be indistinguishable from digital and analog archival materials. This ambiguity stems from the creative processes of many of the artists studied, in which artworks readily pass through many different forms, transitioning from a sculptural object in an exhibition to a disassembled mass of parts in the studio.

For Kirby, her personal analog and digital archives are often components of her artworks. Both institutional and personal archiving are frequent subjects of Kirby's artworks, which incorporate both official and personal documents as key components. Kirby scans ballots generated by participants in *The Power of the Ballot*, and the resulting digital objects enter into her personal archive even as they remain part of the artwork. Kirby also stores the documentation necessary for re-staging her interactive installations in her archives. For Kirby, the preservation of her personal archives is in many ways the primary means for actively preserving her artworks. This overlap between archive and artwork is true for VECTOR, and illustrative of a broader trend in contemporary installation art to incorporate archival elements alongside and within performance (Jones, 2016). The work does not survive as a durable object beyond the length of the performance, but VECTOR actively creates many kinds of documentation, which then enter into the personal archives of Wilks and Haas. They preserve their artworks by managing and maintaining these archives through such strategies as backing up important items, refreshing storage media, and keeping files organized and discoverable.

All of the artists created some kind of documentation for their artworks in the form of photographs or videos, and continued to maintain these digital objects in their personal archives, often long after the original works had ceased to exist. Documentation is a surrogate of the work, but in many instances, becomes the object artists preserve over time, as storing documentation in a personal archive offers a resource-efficient alternative to maintaining complex art objects. Many of the preservation strategies discussed, such as the re-creation of works or translation of works across media, bypass the necessity of storing a single, durable entity, and instead treat the artwork as a variable body of information stored in different places across digital and analog

archives. This is the case for Arcier and Smith, who both use Maya and other digital production software. For these artists, the work is made up of various files stored in their personal digital archives. When Arcier wants to create a new print of a digital image, he just needs to locate the files that make up that work and access them using the appropriate software program.

In addition to aiding in the preservation of artworks, artists discussed a range of other uses for their personal archives. Nearly all of the artists noted the importance of drawing on personal archival material when pursuing professional opportunities, such as applying for grants or juried exhibitions. In completing applications for these opportunities, artists can pull images of previous works to create portfolios or comb through documentation of past exhibitions to generate artist statements. Personal archives can also aid in the retention of skills and knowledge acquired from past projects and experiences. Haas discussed using his archives to access knowledge acquired from past performances:

> I spent two weeks figuring out how to do this one thing; I learned it and I did it, but I haven't done it since. So I need to get back in and figure out what I did and how I did it. It is important for me to hang onto all of that information.

Personal archives can also be essential in addressing artists' legacy and estate concerns (Cousineau and Salvesen, 2005), although none of the artists in this study stressed this point. The present study is limited in that many of the artists were relatively early in their career, and so may not have fully considered legacy and estate issues. Further research specifically into artists' personal archives would be beneficial in expanding knowledge in this area, but the findings of this study demonstrate that the importance of personal archives cut across artists' creative practices and information behavior.

## 7. Preservation as an information behavior

Despite a diversity of creative practices, this study suggests that new media artists face a shared set of challenges in the long-term custody of their artwork, and have cultivated a variety of strategies and attitudes to address these challenges. I have articulated a framework of categories and themes to better understand these challenges, strategies, and attitudes, and to also point toward fruitful avenues for further research. Primary among these, this framework illustrates that the preservation and custody of new media artworks constitutes a particular kind of information behavior, with unique information needs and methods for filling these needs. How do artists develop particular attitudes toward preservation? What factors influence whether to save or decommission an artwork? How do artists develop any technical skills required to implement a particular preservation strategy? How do preservation activities overlap with other artist information behaviors, such as creative processes like finding inspiration for new artworks?

Whittaker (2011) argues that curation and preservation activities have been overlooked in dominant models of individuals' information behavior, and this holds for research on visual artists as well. While the information behaviors of artists have been studied (Hemmig, 2008; Hemmig, 2009; Mason and Robinson, 2011), neither new media artists as a specific population nor preservation as a particular information behavior has received much attention in this literature. The present study suggests that new media artists engage in complex practices

regarding the preservation of artworks, as well as analog and digital archives, but future research is required to further investigate the particular aspects and influential factors that characterize this diverse set of practices.

Marshall (2008) demonstrates that the management of personal digital assets is a complex activity, involving a number of factors including appraising the value of materials, devising schemes to organize and re-find digital files, and gaining technical skills; but these factors will vary greatly depending on the particular needs of the individual – and new media artists certainly present a unique body of cases. Investigating how serious photographers back up collections of photographs, Spurgin (2011) provides an example of preservation as a particular information behavior for a population engaged in a creative practice. Similar research for new media artists might follow on from the present study to examine how artists determine back up processes and organization schemes for their files, or how artists gain technical skills to preserve a particular set of items. Although I included artists with a diverse range of practices for the present study, future research into preservation as an information behavior may benefit from honing in on a particular community of practice, such as artists using VR and 3D modeling software. While I have demonstrated that new media artists share a set of general preservation challenges and approaches, various communities of practice acquire and deploy unique skillsets and technologies, and thus encounter unique information needs in the course of preservation activities. Further investigation of new media artists' preservation activity as an information behavior may orient itself within the broader framework of challenges and approaches outlined here, but pay special attention to the unique needs encountered by a specific community of practice.

## 8. Conclusion: implications for cultural heritage institutions

The findings of this study also suggest implications for cultural heritage institutions. Although preserving collections of new media artworks is a difficult undertaking, institutions face the added hurdle that many significant examples of new media art may not exist long enough to be collected in the first place. While most paintings and sculptures can safely sit for many years until the point at which their cultural value is recognized, new media artworks may be actively destroyed or inadvertently lost early on in their life due to any number of the preservation challenges discussed above. Many art museums have responded to the technological and institutional difficulties in collecting and exhibiting new media artworks by developing innovative strategies for collecting and displaying digital works, such as creating affiliated online galleries or acquiring new media artworks directly from creators via commission (Graham, 2014). However, even these new modes of collection fail to encompass artworks created by less prominent new media artists, as the collection of new media artworks largely remains an exception and not the rule for most cultural heritage institutions.

Rather, this study suggests the need to develop relationships between institutions and artists to address preservation challenges that arise early on in the life of an artwork. In addition to collecting and preserving works in their custody, institutions might forge post-custodial relationships with artists, in which institutions provide support to help artists preserve artworks while the artists maintain custody of the works. Institutions might provide preservation workshops or develop tools for artists to use in the preservation of new media artworks. As

discussed above, institutions might strive to make documentation models more accessible to artists by increasing the visibility of these tools and training artists in how to implement these strategies in their own practice. Post-custodial models have been developed and implemented for distributing authority over archival records between governments and indigenous and minority populations (Gilliland *et al.*, 2008), but further research would be needed to assess the viability of such a model for the preservation of artworks and artists' personal archives.

Changes brought about by the digital era have forced archival institutions to rethink collection development and preservation strategies – including the indirect care of archives "in the wild" – in order to safe guard society's digital cultural heritage, the vast majority of which will never enter into institutional holdings (John *et al.*, 2010). To ensure the preservation of today's artistic cultural production, art museums may also need to further revise their function, supporting the information needs of artists in addition to serving as storehouses for art objects. As more and more artists make use of digital technologies, museums will increasingly need to devise strategies for preserving new kinds of artworks. Museum professionals can better inform these preservation efforts by finding ways to work with artists in order to develop an understanding of the preservation challenges experienced at all stages in the creation, custody, and care of an artwork.

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**Further reading**

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