The Sustainability and Preservation of Virtual Museums

Katie Fisher

Email: kfish26@jhu.edu

Johns Hopkins University

Museum Studies Digital Curation Certificate Program

4/23/2018
Abstract

This paper examines the sustainability of virtual museums. As there is not a working definition of a virtual museum, for the purposes of this paper a virtual museum will be defined as an institution that collects digitized objects (photographs, artworks, and three-dimensional objects) or born-digital objects contributed by physical museums, virtual organizations, or individual donors and organized as collections in a non-corporeal location for research, public engagement and education. This paper examines three virtual museums. The three museums are Rhizome, a born-digital art museum, National Women’s History Museum, a virtual precursor to a physical National Women’s History Museum on the National Mall in Washington, D.C. and Maine Memory Network, a digitized collection from Maine museums and historical societies created by the Maine Historical Society. This paper will thoroughly examine four key aspects of virtual museums: business models and long-term sustainability, digital preservation, exhibitions, and audience engagement. This study describes how and why these three virtual museums were created, analyzes industry-wide perceptions of virtual museums, and proposes the development of standards of sustainability for virtual museums.

Keywords: virtual museum, sustainability, business model, digital preservation, virtual exhibitions, audience engagement
# The Sustainability and Preservation of Virtual Museums

## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to research</td>
<td>3</td>
</tr>
<tr>
<td>Definition of virtual museums</td>
<td>3</td>
</tr>
<tr>
<td>Methodology</td>
<td>4</td>
</tr>
<tr>
<td>Literature Review</td>
<td>4</td>
</tr>
<tr>
<td>Institutional Histories and Missions</td>
<td>5</td>
</tr>
<tr>
<td>Rhizome</td>
<td>5</td>
</tr>
<tr>
<td>National Women’s History Museum</td>
<td>6</td>
</tr>
<tr>
<td>Maine Memory Network</td>
<td>7</td>
</tr>
<tr>
<td>Business Models</td>
<td>9</td>
</tr>
<tr>
<td>Rhizome</td>
<td>9</td>
</tr>
<tr>
<td>National Women’s History Museum</td>
<td>10</td>
</tr>
<tr>
<td>Maine Memory Network</td>
<td>12</td>
</tr>
<tr>
<td>Digital Preservation</td>
<td>15</td>
</tr>
<tr>
<td>Rhizome</td>
<td>15</td>
</tr>
<tr>
<td>National Women’s History Museum</td>
<td>17</td>
</tr>
<tr>
<td>Maine Memory Network</td>
<td>18</td>
</tr>
<tr>
<td>Virtual Exhibitions</td>
<td>20</td>
</tr>
<tr>
<td>Rhizome</td>
<td>20</td>
</tr>
<tr>
<td>National Women’s History Museum</td>
<td>23</td>
</tr>
<tr>
<td>Maine Memory Network</td>
<td>27</td>
</tr>
<tr>
<td>Audience Engagement Evaluation</td>
<td>30</td>
</tr>
<tr>
<td>Rhizome</td>
<td>30</td>
</tr>
<tr>
<td>National Women’s History Museum</td>
<td>31</td>
</tr>
<tr>
<td>Maine Memory Network</td>
<td>32</td>
</tr>
<tr>
<td>Conclusion</td>
<td>33</td>
</tr>
<tr>
<td>Works Cited</td>
<td>36</td>
</tr>
<tr>
<td>Appendix A: Rhizome</td>
<td>39</td>
</tr>
<tr>
<td>Appendix B: National Women’s History Museum</td>
<td>44</td>
</tr>
<tr>
<td>Appendix C: Maine Memory Network</td>
<td>50</td>
</tr>
</tbody>
</table>
Introduction

At the turn of the 21st century, the internet was growing, technology was thriving, and more businesses were venturing into the unknown virtual realm. Those cultural institutions that were able to hold on through the ebb and flow of the internet have developed a new type of institution with its own set of rules. Studies have focused on four aspects of virtual museums: businesses models, digital preservation, exhibition development, and audience engagement. This paper reviews these practices through published literature and case studies to learn how virtual museums survive and thrive. The examination of virtual museums is important because it will give the cultural heritage community examples of the risks and rewards of virtual museums. This research also provides an understanding of how and why these three virtual museums were created, analyzes industry-wide perceptions of virtual museums, and proposes the development of standards of sustainability for virtual museums.

For the purposes of this research, virtual museums are defined as an entity with collections of digitized objects (photographs, artworks, and three-dimensional objects) or born-digital objects contributed by physical museums, virtual organizations, or individual donors and organized as collections in a non-corporeal location for research, public engagement and education. The three virtual museums examined in this study are Rhizome, a born-digital art museum, National Women’s History Museum, a virtual precursor to a physical National Women’s History Museum on the National Mall in Washington, D.C. and Maine Memory Network, a digitized collection from Maine museums and historical societies created by the Maine Historical Society. All three museums have been successful for close to two decades by developing a solution for a perceived need within the museum industry.
Methodology

Two primary methodologies were used during research. The first method was open-ended interviews. The second research method was meta-analysis. Meta-analysis provided a foundation of knowledge about the topic in order to properly evaluate the three virtual museums examined in this study. Open-ended interviews provided insight from key players in the virtual museum industry. The first interview was conducted with Rhizome, a leader in born-digital artwork preservation and open-access. The contact at Rhizome was Zachary Kaplan, Executive Director. The interview pertained largely to digital preservation initiatives. The second interview was with National Women’s History Museum in Alexandria, Virginia. During the interview with Elizabeth Maurer, Director of Programs, virtual audience engagement and exhibition creation were thoroughly discussed. The final interview was with Maine Memory Network in Portland, Maine. Two separate interviews were conducted with Maine Memory Network. One with Kathy Amoroso, Director of Digital Engagement and the other with Jamie Rice, Director of Library Services and Head of the Research and Scholarship Department. Between the two interviews exhibition design process, business models and digital preservation practices were discussed at length. Follow-up questions were sent out by email and kindly answered by National Women’s History Museum and Maine Memory Network. Rhizome, regretfully, did not reply.

A multitude of previous studies have been done individually on the four main categories of virtual museums: business models, digital preservation, exhibition development, and audience evaluation strategies. In-depth looks at each of these four categories provides a foundation for analyzing the success of the three virtual museums in regard to these four categories.

Literature Review

Virtual museums as a whole have not been studied in-depth. Merely different parts of virtual museums have been analyzed to determine preservation best practices, user friendly
systems, economic sustainability, and exhibition strategies. Much research has been done in the form of case studies, analyzing digital preservation techniques and audience engagement. A fair amount of research has been conducted in Europe. However, those studies conducted in the United States have only focused on large institutions such as the Smithsonian. While the Smithsonian has done impressive work in the digital sector, it is not virtual due to its multitude of physical locations. The majority of virtual exhibition review has been done in terms of mobile application. While mobile compatibility is worthwhile, the endeavors of mobile application versus entire virtual existence are two different undertakings. This paper compiles the four different categories of virtual museums in a holistic way to identify indicators of success and then uses these indicators to assess the three virtual museums chosen for this in-depth examination.

Institutional Histories and Missions

The three virtual institutions examined here are physically managed in different locations: Rhizome is affiliated with the New Museum in New York, New York, National Women’s History Museum (NWHM) is in Alexandria, Virginia, and Maine Memory Network (MMN) is a part of the Maine Historical Society in Portland, Maine. All have collections of digitized objects (photographs, artworks, and three-dimensional objects) or born-digital objects contributed by physical museums, virtual organizations, or individual donors and organized as collections in a non-corporeal location for research, public engagement and education. All three institutions began in the late 1990s with individual missions to meet a growing need of the developing virtual community.

Rhizome’s mission is to “champion born-digital art and culture through commissions, exhibitions, digital preservation, and software development” (Rhizome, 2018).
was first developed as a listserv in 1996 for those interested in new media art. The listserv
developed a thriving community and formalized into a presentation platform (Kaplan, 2018).
Rhizome then began hosting live events and public presentations of new digital artworks. In
1999, Rhizome opened Artbase, an open-access digital archive for born-digital artworks. The
intent of Artbase was and is to provide a digital space to keep born-digital artworks safe.
Rhizome would accept “anything that could be delivered as a file” (Kaplan, 2018). Although
Rhizome did not take ownership of the pieces it “would maintain an artist proof of” each piece
(Kaplan, 2018). Artbase was open until 2008 and collected more than 2,000 items. Today,
Artbase is available to the public, but no longer collects items. In 2000, Rhizome hit a growth
point in which the institution could no longer ensure its own continual existence. At this point,
Rhizome began applying for grants which supported the institution until a new avenue became
available. In 2003, Rhizome became affiliated with the New Museum as the new media branch
working with “art and technology as a space” (Kaplan, 2018). Today, Rhizome creates emulation
software, web-archiving platforms and has developed as a leader in digital preservation due to its
original interest in creating a safe and accessible space for born-digital art.

National Women’s History Museum’s mission is to “educate, inspire, empower, and shape
the future by integrating women’s distinctive history into the culture and history of the United
States” (National Women’s History Museum, 2018). The roots of National Women’s History
Museum began in the 1920s. Following the ratification of the 19th Amendment in 1920, Adelaide
Johnson, American sculptor and feminist, created the sculpture *Portrait Monument to Lucretia
Mott, Elizabeth Cady Stanton, and Susan B. Anthony*. The sculpture was donated by the National
Women’s Party to “the people of the United States” at the U.S. Capitol on February 15, 1921
In 1995, eventual founders and CEO of the National Women’s History Museum discovered the *Portrait Monument*, also known as The Woman Suffrage Statue, in the Crypt. The mission to move the statue to the Capitol Rotunda was the beginning of the movement for NWHM. The Woman Suffrage Statue Campaign worked with Congress for the next year and a half for the approval to move the statue from the Crypt to the Rotunda of the Capitol. Once private funds were agreed to be used, instead of government funds, the House of Representatives agreed to the movement of the piece. The move began on May 10, 1997 and took two days to complete due to the seven-ton magnitude of the statue. Today, the *Portrait Monument* sits in the Rotunda of the Capitol building. This project fortified the need for a women’s history museum in the Nation’s capital. The volunteer group that moved the *Portrait Monument* formed a nonprofit organization, but the battle to move Johnson’s piece was only the first of many Congressional battles NWHM would face. To this day, the museum continues to lobby Congress for a spot on the National Mall in Washington, D.C. Until such a time, the virtual National Women’s History Museum continuously “raises awareness and honors women’s diverse experiences and achievements through its dynamic online museum” (National Women’s History Museum, 2018).

Maine Memory Network is a project of Maine Historical Society (MHS) in Portland, Maine. Maine Memory Network aims to “provide access to thousands of historical items belonging” to Maine’s state history (Maine Memory Network, 2018). In 1999, Maine Historical Society wanted to develop a digital program and applied and received a $270,000 grant from the state of Maine as a part of the state’s New Century Program. This money was used to develop Maine Memory Network. After hiring Maine Memory Network’s first project director, MHS decided it
wanted other state organizations to be able to share their collections on Maine Memory Network, basing this idea off Library of Congress’ digital sharing platform, American Memory. However, there was no digital archive software at that time. To overcome this obstacle, Maine Historical Society partnered with a “stock photography company” (Amoroso, 2017). The photography company had a website where photographers could upload photos and include a description that could be found as a result of an internet search. An uploading and searchable program was what MHS wanted for its new Maine Memory Network. Maine Historical Society licensed the stock photography company’s code for $10,000 and then contracted the photography company to customize the technology. After the system was created, a small team from MHS began scanning items from the Maine Historical Society collection. Once Maine Historical Society standardized its scanning process and catalog fields, Maine Memory Network applied for another grant for its outreach program in 2001. Maine Memory Network has developed an intensive outreach program, but in order for cultural institutions to be part of MMN they first have to apply online.

New contributing partners (CP) fill out an application form that provides information about the partner’s collection, equipment, their role in the community, and why they want to be a part of Maine Memory Network. Maine Memory Network does not have a selection process for new contributing partners. However, MMN will only accept items that are of “interest or historical prominence” to Maine and only allows “primary sources” to be upload to the site (Amoroso, 2017). Three field officers from MMN travel around the state to new contributing partners in order to train the staff on scanning practices and cataloging for MMN. Currently, the organization has 260 contributing partners. Maine Memory Network consists of about 20% of items from Maine Historical Society, about 80% are from the other 260 contributing partners,
and .02% are from individual contributors, a new type of contributor MMN began in 2018 (Amoroso, 2018).

**Business Models**

Many studies conducted on virtual museum business models have looked at only one component of museums, whether that is visitor interaction, virtual exhibitions, or data collection. Many business models of virtual museums have been analyzed using scientific methods, such as Ciurea, and Filip’s (2015) “simplified business model.” Few studies have looked at business models evolving out of the mission of the institution. Yet, the success of these three virtual museums comes not from calculated business theorems, but from a drive to preserve digital items and create easy accessibility. Hung, Chen, Hung, and Ho (2013) hypothesized that “perceived usefulness (PU) and perceived ease of use (PEOU) has positive influence on a user’s attitude toward using digital museums.” All three virtual museums developed out of a desire to easily provide knowledge and resources to their audience while at the same time preserving newly created digital items. The business models of all three institutions have succeeded because the organizations found a need in the industry and developed their business model with their constituents in mind.

Rhizome operates with a business model based on the growing need to preserve born-digital art. Rhizome sought to “challenge traditional museum models and keep with Rhizome’s nonhierarchical name” by creating stability for this new form of art (Kaplan, 2018). Rhizome is a term, used primarily in botany, to describe a horizontally growing root which produces shoots (Merriam-Webster, 2018). A rhizome root provides life to multiple offshoots instead of one vertical offshoot. Rhizome had a drive to develop as an entity that would help multiple facets of the digital art world survive. It did this by developing open-source software for born-digital
items, developing digital preservation as a field, and developed the mindset of born-digital material as items worth collecting and preserving.

Rhizome is supported by generous contributions from “corporations, foundations, public agencies, and members” but it is not self-sustaining (Rhizome, 2018). The New York State Council on the Arts has supported Rhizome since its large growth point in 2000 (New York State Council on the Arts, 2018). The Andrew W. Mellon Foundation has kindly supported Rhizome’s web-archiving platforms (The Andrew W. Mellon Foundation, 2018). Rhizome has also received grants from the Institute of Museum and Library Services, Google Cultural Institute and The Andy Warhol Foundation for the Visual Arts, to name a few (Rhizome, 2018). Membership fees are also a large contributor to Rhizome’s financial support. The financial contributions of these foundations and corporations equals multimillions of dollars. The fact that these highly reputable foundations continually provide financial assistance to Rhizome shows the success of its products and programs, but this also shows that Rhizome is not self-sustaining.

Rhizome operates under the premise that it will continue to succeed based on its highly successful 20 years in the born-digital artwork and preservation fields. Due to this optimism, Rhizome does not have a formal succession plan (Kaplan, 2018). The board is structured to watch out for failure and stop it from happening, but failure is not a concern due to Rhizome’s successful history (Kaplan, 2018). Rhizome is extremely committed to its practice of born-digital art and preservation. Large giving companies acknowledge this commitment by continuing to provide further funding support. Rhizome plans to continue to champion born-digital artwork and its artists through the help of grants.

National Women’s History Museum wanted to better represent women throughout United States history. The virtual portion of its museum came to fruition due to the fact the bill to secure
a physical home on the National Mall in Washington, D.C. continues to sit in Congress. National Women’s History Museum persisted through this challenge by creating its virtual presence. The museum chooses to identify as a national museum and operates on a nationwide educational business plan. National Women’s History Museum developed its strategic plan based on this educational business model.

The strategic plan identifies two primary audiences: Teachers/Students and Adult History Aficionados (Maurer, 2018). Programs are developed for these two audiences through live and digital programming, and events (Maurer, 2018). The education portion of the virtual museum offers electronic field trips, teacher newsletters, and general citable information. The education section bases its content on all state social studies standards. Staff read every K-12 social study standard from each state to identify standards which include women and categorize them by topic (Maurer, 2018). These “topic and grade clusters” are used to identify content for NWHM education curriculum (Maurer, 2018). Future endeavors include adding “significantly more educational materials, including lesson plans” on its educational platform and having NWHM staff presenting at education conferences (Maurer, 2018). This is all “meant to increase and serve the education audience” and maintain its sustainability (Maurer, 2018). Adult History Aficionados are targeted through “super fun content” on the website to get return visitors (Maurer, 2018). An e-newsletter on a specific theme is sent out monthly. This e-newsletter has been successful in that the subscription numbers continue to grow, and NWHM has seen a rise in visitors to the donation and store portion of the virtual museum (Maurer, 2018). Donors love to see and support education outreach initiatives. Through the strategy of targeting these two primary audiences, National Women’s History Museum has developed a sustainable platform based on the foundation of an educational nationwide business plan.
National Women’s History Museum’s means of revenue mainly comes from memberships. Donations from direct mail campaigns, e-newsletters, galas, and its digital store and book sales have also greatly helped NWHM become sustainable (Maurer, 2018). Recently, there has been a development in newer streams of revenue such as walking tours in Alexandria, Virginia and partnering with two for-profit companies for broadcasting digital field trips (Maurer, 2018). National Women’s History Museum also privately conducts live digital field trips and may charge for these later down the line. Small donors and members love to see education outreach campaigns and are greatly supportive of such efforts (Maurer, 2018). National Women’s History Museum has a national reach by raising money in all 50 states and territories but wants to begin building a local presence (Maurer, 2018). Even after a physical space is secured, NWHM plans to maintain its digital presence because it keeps NWHM in people’s homes since the majority of people will not make it to the museum.

As with Rhizome, National Women’s History Museum does not have a formal succession plan. However, National Women’s History Museum’s partnership with Google Arts and Culture can act as an unofficial succession plan because every digital item of NWHM is backed up on Google Arts and Culture’s servers. National Women’s History Museum has been a part of Google Arts and Culture since 2014 and does have a formal signed agreement with the digital heritage consortium. This ensures that if NWHM were to disband, the information is still available to the public through Google Arts and Culture. The museum has created a sustainable business model through educational endeavors, such as teaching and research resources and e-newsletters, that are supported by memberships and donors.

Maine Memory Network created its business plan as the institution developed. The business model to teach digitization skills developed out of the desire to compile primary sources
about the history of the state of Maine. Maine Memory Network based its idea to compile primary sources off the Library of Congress’ digital sharing platform, American Memory (Amoroso, 2018). Maine Memory Network trains new contributing partners to digitize objects for free. The contributing partner is trained on its own equipment in its own facility to heighten the success of that contributing partner. Maine Memory Network then hosts metadata for content and retains master TIF files and JPEG files on its local servers, Rackspace.com, Linode.com and Amazon Web Services (Amoroso, 2018). The CP is also responsible for preserving its copy of the digitized items (Rice, 2018). Maine Memory Network built a business model on the need of crafting digitization skills, and then expanded its business model to include digital preservation practices as well.

Maine Memory Network’s business model has not developed into a long-term sustainable venture (Amoroso, 2018). Between 2001 and 2017, Maine Memory Network has received 11 grants from the Institute of Museum and Library Services to fund and maintain the virtual institution. Maine Memory Network also partners with another Maine Historical Society program, Vintage Maine Images. Vintage Maine Images has a business model of a revenue program. Maine Historical Society owns the copy right to the items it puts on MMN, which are then sold on Vintage Maine Images (Rice, 2018). The revenue from Vintage Maine Images covers the cost “to run the reproduction services and the printing supplies” (Amoroso, 2018). Maine Memory Network’s contributing partners can also sell items on Vintage Maine Images, and the “proceeds are split 50/50” with the CP (Rice, 2018). The business model of Maine Memory Network has allowed it to develop as a successful virtual museum. However, even with endeavors such as Vintage Maine Images, Maine Memory Network is still working to develop a sustainable business model.
Maine Memory Network is the same as Rhizome and National Women’s History Museum in that MMN also does not have a formal succession plan (Amoroso, 2018; Rice, 2018). The virtual museum does preserve itself and its collection on multiple storage server. The whole of Maine Memory Network is saved to its home servers in Portland, Maine and to its cloud. The code of MMN is hosted on Linode.com, “a privately-owned cloud hosting server,” and the master TIFs and JPEGs are saved to and served from Amazon Web Services, “a cloud-computing platform” (Linode, 2018; Amazon Web Services, 2018). Maine Memory Network’s code and digital files are backed up on both of these third-party’s servers. Despite these practices, Maine Memory Network does not have a formal succession plan with another institution in the event of decline. Regardless of the lack of a formal succession plan and a sustainable business model, Maine Memory Network plans to continue its mission “to provide access to thousands of historical items” that explains Maine’s state history (Maine Memory Network, 2018).

The business plans of all three virtual museums developed organically. However, only one has developed into a sustainable endeavor. National Women’s History Museum did this by taking its mission to educate and turned it into a strategic plan to educate two primary audiences who returned to support NWHM’s education efforts thus creating a sustainable model. These three virtual museums began at roughly the same time, the late 1990s, but two are still navigating into sustainable ventures in the ever-changing digital world.

All three museums lack a critical component of a virtual presence and that is a succession plan. National Women’s History Museum and Maine Memory Network have taken the steps towards a succession plan in that their data and content are backed up through a formal agreement with a third-party. However, a formally written plan within the articles of
incorporation or other organizational documents can ensure proper care of the virtual museums’ collections should the worst happen.

Digital Preservation

When dealing with items in any cultural heritage institution, preservation is a monumental topic. In the case of virtual museums, the topic is no less daunting, and, perhaps, digital preservation may be even more intimidating. Walters (2010) reminds those tackling the virtual cultural heritage realm that “if we fail to build and sustain digital collections, our patrons – communities of users and producers – will lose the materials they depend upon” and that cost will be “extremely high.” Dallas (2015) claims that “despite the inclusiveness professed by the digital curation community, museum curators still remain the ‘single species […] missing from this Noah’s ark’ of scholars and practitioners actively engaged with digital curation.” Cultural heritage institutions need to actively engage in the preservation of digital objects or else risk losing an entire generation and in turn future generations who increasingly make born-digital items on a daily basis. The digital curation community has at times turned its nose up to the practice of online content curation brushing it off “as mere aggregation or ‘channelization’ of content” (Dallas, 2015). These three virtual institutions challenge the statement that museum curators are not involved in digital preservation by creating individualized practices of saving and organizing digitized or born-digital items.

The founders of Rhizome felt there was little protection for born-digital art. Rhizome’s digital archiving platform, Artbase, was born out of the need to have a home for born-digital art. Artbase took “basically anything that could be delivered as a file” (Kaplan, 2018). Rhizome did not take ownership, but “would maintain an artist proof of anything that was submitted” (Kaplan, 2018). Artbase provided a place to keep these pieces safe but the rights remain with the artists. In
the late 1990s and early 2000s there was not a traditional way to preserve digital art. Rhizome wanted to promote open-access and safe keeping, which it accomplished through Artbase. The open-accession model collected more than 2,000 items by the time Artbase closed in 2008. Artbase is still available to the public although it no longer takes new items.

At the close of Artbase, Rhizome knew there was still a need to preserve born-digital art and a growing need to preserve the web in general. In 2009, Rhizome launched a digital preservation software focused on championing open-source software access for born-digital items. The open-source software created the tools and platforms to preserve born-digital art in Artbase and allowed other institutions to preserve newly created works and their own websites. Rhizome offers two archiving platforms for free: pywb, “the core of Rhizome’s web archiving toolset,” and Webrecorder (Rhizome, 2018). Rhizome’s web-archiving platform, Webrecorder, developed out of the need to preserve artwork that incorporated social media, whether that be Facebook, Instagram or Google Maps (Kaplan, 2018). The program makes interactive copies of any website and uses the copy to preserve the collection (Kaplan, 2018). The copy made from Webrecorder is then saved to pywb (Rhizome, 2018).

In more recent endeavors, Rhizome took a leap into emulation software. Rhizome uses oldweb.today to make past web browsers available to the public for free. Through oldweb.today, which can be found through the Rhizome and Github websites, users can chose to emulate browsers and websites just as they were during their heyday. Visitors can only use the browsers Rhizome provides (Internet Explorer, Safari, Firefox, Google Chrome, Netscape Navigator, and NSCA Mosaic) and need to have a URL address. Visitors select the browser they want to try and the date of use, ex. March 15, 2004, and then type in the URL address. A screen is then generated in which users can explore their chosen website on the preferred browser on the
selected date. Rhizome has also been able to give attention to exhibitions and fund new born-digital artworks. As a result, Rhizome developed as a leader in the preservation of digital art due to its original interest in creating accessible software for born-digital art collections.

National Women’s History Museum has a physical collection, purchased a number of years ago, which represents the 19th and early 20th century women’s suffrage and rights movements. The collection is stored in a climate-controlled area of NWHM’s offices in Alexandria, Virginia. A large portion of that collection has been digitized and can be seen through virtual exhibitions. At the beginning stages of digitization, items in the collection were professionally photographed (Maurer, 2018). Now new objects are “photographed by staff using a photo box” (Maurer, 2018). One photograph of each object is “preserved in a dedicated file folder” (Maurer, 2018). National Women’s History Museum also preserves digital materials and online exhibits through digital platforms.

National Women’s History Museum recently re-launched its website under the new URL womenhistory.org. This new URL uses Drupal, “a free open-source content management software” (Drupal, 2018). The website is hosted by GoDaddy.com, a “domain name registrar and web hosting company,” located in Scottsdale, Arizona (GoDaddy, 2018). National Women’s History Museum has a backup server which has image files “in lossy and non-lossy formats” meaning a compressed file, such as a JPEG, and files with all their original data. Credit information for all images NWHM owns, has permission to use, and is in the public domain are also on its back up servers (Maurer, 2018). National Women’s History Museum has also been a part of Google Arts and Culture since 2014. Google Arts and Culture is a closed circle meaning only institutions who are a part of Google Arts and Culture can see uploaded items. National Women’s History Museum uploads digital images and catalog information into Google Arts and
Culture’s database in which its items are marked as public to the Google Arts and Culture universe. This means that NWHM or others in Google Arts and Culture can use those uploaded images in exhibitions within the Google Arts and Culture world with proper credit to NWHM.

National Women’s History Museum uses Google Arts and Culture’s templated platform to create an exhibition which is then embedded into NWHM’s website. This practice means exhibitions are on National Women’s History Museum’s servers as well as Google Arts and Culture’s servers. Thus, creating two copies of the exhibition stored in different places for safe keeping. Every exhibition project gets a project number and file folder. This is to track images, research and final text. Even though these project files are not the finalized product of the exhibition all of the information is safely stored for future needs.

National Women’s History Museum takes steps to preserve its digital holdings. GoDaddy.com has its holdings in Scottsdale Arizona, which is where the whole of NWHM’s website is stored. Google Arts and Culture has servers located in North Carolina to which NWHM has exhibitions and its digital collection saved (Maurer, 2018). Plus, there are the NWHM’s digital keepings in Alexandria, Virginia. Different portions of National Women’s History Museum are saved to a multitude of locations which allows the institution to provide long-term digital preservation for its digitized collection.

Maine Memory Network collects born-digital items but does not accession these items. Each contributing partner maintains ownership of the physical analog item, and the master files of the digitized objects. The items that Maine Memory Network gets from CPs are digitized items from the CP’s collection. These digitized items, be they scans or photographs, are born-digital in the form of master TIFs and JPEGs. Maine Memory Network takes these born-digital scans or photographs and maintains the metadata and digital file on its own servers. The digital
collection is also stored on Amazon Web Services, its back up servers, and on Rackspace.com, “a leading managed cloud company” (Amoroso, 2018; Rackspace, 2018). The CP is responsible for preserving its copy of the digitized files (Rice, 2018). Maine Memory Network has its code, all the metadata and master TIF files and JPEG files saved to different locations across the United States. Maine Memory Network’s code is saved on its local servers in Portland, Maine and Linode.com, headquartered in Galloway, New Jersey. Linode.com also has data centers in Dallas, Texas, Fremont, California and Atlanta, Georgia (Linode, 2018). Master TIF and JPEG files are saved on MMN local servers, Amazon Web Services headquartered in Seattle, Washington, and Rackspace.com headquartered in Windcrest, Texas (Amoroso, 2018; Amazon Web Services, 2018; Rackspace, 2018). The multitude of locations to which Maine Memory Network is backed up allows the institution to provide long-term digital preservation initiatives to its CPs and their digitized collections.

Maine Memory Network stresses that acquisition and preservation of digitized and born-digital objects are the easy part of this field (Rice, 2018). The content is saved on the website and on the servers. The difficult part is providing access to and using items that do not easily lend themselves to exhibitions. Maine Memory Network operates to provide access to digitized items that represent Maine’s state history, however, not all digital items are easily exhibitable (Rice, 2018). Successful preservation strategies differ from physical museum preservation strategies because virtual preservation includes preserving as well as providing access to the collection. Maine Memory Network also has the added obstacle of allowing other museums to keep ownership of digital items while preserving the Maine Memory Network presentation copy.
Virtual Exhibitions

When used in conjunction with physical museums, digital exhibitions and uploaded digitized items help bring in visitors to the physical museum. It is now an accepted belief that visitor numbers rise due to the desire to see the real objects that are displayed online. Virtual exhibitions designed by a virtual museum can successfully obtain the first goal of drawing in visitors to the website. However, there is no physical museum or items for the audience to visit. This in turn creates a problem for virtual museums. Virtual exhibitions have to be able to stand alone and draw people back in. Dumitrescu, Lepadatu, and Ciurea (2014) state that virtual exhibitions need to have the following characteristics in order to stand on their own: “localization, meaning to put the user in the context; relevance, in order to attract many visitors; interaction, meaning to give users the possibility to interact with the application; maintainability, meaning the possibility to be updated; [and] accessibility, meaning to reach audiences that the physical exhibition never could attend.” The three virtual museums aim to create exhibitions that meet these criteria. To ease possible confusion in this section, the following definitions apply: exhibitions are overarching themes and exhibits are small stories pertaining to the larger theme.

Rhizome develops exhibitions in three different ways: commission, presentation and preservation programs (Kaplan, 2018). Commissioned exhibitions are done by supporting new projects through grants and micro grants (Kaplan, 2018). Rhizome presents exhibitions by co-curating exhibitions with the New Museum under Art Net Anthology. Preservation of exhibitions is done through open-access software development, which is
a “major part of what Rhizome does and a real expertise” (Kaplan, 2018). Rhizome’s main exhibition platform, which is easily accessible to users on Rhizome’s website, is Art Net Anthology. Art Net Anthology uses multiple platforms within one exhibition. Net Art Anthology is a multi-layered large exhibition that begins with a traditional vertical webpage (Figure 1). As users scroll down they then see clickable options for each exhibit (Figure 2).

Once an exhibit has been selected, multiple platforms, such as text, pictures, and other links appear in the exhibit (Figures 3 and 4).

Some exhibits also incorporate emulation software. The exhibit, *Heritage Gold*, uses emulation to help users see how the virtual exhibit was designed and accomplished (Figures 5 and 6). This form of emulation is different than what Rhizome produces on its website, oldweb.today. Oldweb.today allows users to use different browsers to see how websites looked in the past.
*Heritage Gold* allows users to see the exhibit design process through emulating different applications on a computer.

Rhizome also provides access to Artbase, although it is no longer accepting new pieces. Artbase takes users to a database in which users can search for a piece of art either by date, artist name, or title (Figure 7). Below the search bar is a list of the artworks in Artbase. Users can also simply click on a piece of art. The artwork link takes visitors to another webpage which gives a small overview of the artist and the artwork. An additional link takes visitors to the artwork which is in a vertical webpage style (Figure 8). To view all the figures discussed in this section in a larger context please refer to Appendix A: Rhizome.
The National Women’s History Museum owns a small physical collection representing 19th and early 20th century women’s suffrage and rights movements. This collection consists “primarily of documents and photographs” and also includes smaller 3D items such as “campaign buttons, paper sewing patterns, and scrap books” (Maurer, 2018). Today, the museum staff does not actively collect for the museum, either analog or born-digital items. National Women’s History Museum will take items that support programs and educational projects through proper accession practices such as deed of gifts and records, but these items are not accessioned into the collection. Through the practices of a good collections manager, the agreements with donors “are very clear that nothing is accessioned, and that NWHM may dispose of the artifact through sale or gift to another” (Maurer, 2018). In practice, National Women’s History Museum staff abides by strict accessioning rules. The staff only accept “donations that it feels it can properly care for, that support a current or future exhibit, and that is not particularly rare” (Maurer, 2018). The virtual museum also does not accession analog items because the museum does not have a building or physical exhibit space with an interpretive plan for the collection. Due to this lack of physical space, NWHM does not want to build a collection to maintain and care for without having a vision for the collection. The physical collection is stored in a climate-controlled storage space in Alexandria, Virginia and is interpreted for visitors to see through appointment.

For virtual exhibitions, National Women’s History Museum uses photographs of items in the collection or on loan, purchases the rights to use images as well as

Figure 1
uses images that are in the public domain.

NWHM uses three platforms for its exhibitions: Google Arts and Culture, Prezi, and Timeline JS. The Google Arts and Culture templated platform is used to create exhibitions which is then embedded into the NWHM website. Visitors click on the link to the exhibit of their choice which then takes them to a webpage with the title of the exhibition and a link to the Google Arts and Culture page (Figure 1). Visitors can then click on the link to see the full exhibit in Google Arts and Culture, which is in a webpage style (Figure 2).

National Women’s History Museum also uses Prezi as an exhibition platform (Figure 3). Prezi is a storytelling presentation software used as an alternative to traditional slideshow presentations. Rather than a vertical webpage presentation, such as with Google Arts and Culture, Prezi enables visitors to see an overview of the topic, easily pan between topics, zoom in on details, and return to the full overview to reengage with the whole context (Figures 4 through 6). This engagement makes Prezi a more interactive platform for the audience.
National Women’s History Museum’s favorite exhibition platform is a slideshow/timeline platform called Timeline JS (Maurer, 2018). Timeline JS does not involve any coding on the curator’s end of the exhibition. The timeline is a spreadsheet derived from a Google Doc. The exhibition curator enters the date, text, and link to the image online (which is also in a Google drive folder) into a Google Doc. Timeline JS then pulls all the fields from the Google Doc and creates the exhibition timeline (Figures 7 and 8). Timeline JS also allows users to embed videos, the platform is easy to update, and works well with mobile devices. To view all the figures discussed in this section in a larger context please refer to Appendix B: National Women’s History Museum.

National Women’s History Museum shies away from 3D gallery mapping platforms, such as SketchUP, due to the technological power needed to create an exhibition. To create even a slimmed down version of a gallery space takes in-depth computer work and a great deal of
server space (Maurer, 2018). The viewers of a 3D mapping platform also have to have a powerful computer to run the design. If the visitor’s computer cannot run the program this can lead to an unsatisfactory visitor experience. National Women’s History Museum wants to ensure that all visitors can view each exhibit without failure. National Women’s History Museum also needs to analyze who is going to be accessing the exhibitions and why. Visitors do not seem to be using the museum in ways that supports investment into 3D rendered environments because the majority of the audience is conducting research for school projects. Student research is done by a Google search, “not following threads through the internet” (Maurer, 2018). This means that to successfully engage students in a 3D created gallery space, the gallery has to be a game which then means curators are creating a game world rather than a gallery (Maurer, 2018). National Women’s History Museum can be more effective by publishing content, text and videos on a webpage. National Women’s History Museum is also very conscientious of language throughout its site. Text aimed towards school age audiences are written in full but short sentences. History articles are written for students, not for teachers to translate to students, and are therefore written to the students’ development level and tied to state curriculum. Text aimed for the Adult History Aficionados has a more casual and conversational tone of voice.

Maine Memory Network built its own website platform and uses a “homemade system” called Exhibitbuilder and Sitebuilder to create exhibitions (Amoroso, 2018; Rice, 2018). All exhibitions are managed through the Maine Memory Network server and organized based on topic. As with National Women’s History Museum, Maine Memory Network keeps a copy of text, images, and the virtual presentation of every exhibition. Maine Memory Network approaches its exhibitions from a digitization perspective and its contributing partners are the curators behind the exhibitions. A large portion of the objects on Maine Memory Network are
from Maine Historical Society. Maine Historical Society takes a physical exhibit then curates an online exhibit from the physical labels and adds additional information (Amoroso, 2018). Maine Memory Network helps with digitization and placing the pieces of the exhibit into the site builder. Only about 10% of virtual exhibitions on Maine Memory Network were once physical exhibits (Amoroso, 2018). Contributing partners can create their own exhibits if they wish.

Exhibition creation often depends on the CP’s goals, such as if the CP comes to Maine Memory Network with the idea to tell the story of the partner’s town. Goals such as these make it easy to plan for an exhibition while in the digitization stages (Amoroso, 2018). Maine Memory Network then teaches CPs how to put the virtual exhibition together. Maine Memory Network also sought to expand its virtual exhibitions and created the Maine Community Heritage Project. This project was a yearlong project partnered with 16 community schools, libraries, and historical societies. With the guidance of Maine Memory Network, the community groups curated exhibits and created a site using the Sitebuilder on the Maine Memory Network website (Amoroso, 2018).

Maine Memory Network’s Sitebuilder creates exhibitions in a webpage style. The exhibitions webpage has links to a multitude of exhibitions. These links take visitors to another webpage which gives an overview of the topic with multiple links to different exhibits (Figure 1). Visitors can then click on the additional links to view the smaller exhibits. Exhibits

![Figure 1](image-url)
can be viewed in a slideshow format (Figure 2) or a list view format (Figure 3). To view all the figures discussed in this section in a larger context please refer to Appendix C: Maine Memory Network.
Hung et al., (2013) hypothesized that “perceived usefulness (PU) and perceived ease of use (PEOU) has positive influence on a user’s attitude toward using digital museums.” National Women’s History Museum and Maine Memory Network created their websites for two different groups, students and teachers, and Adult History Aficionados. Students are comfortable with technology and have been shown to use virtual exhibitions for research. Students perceive National Women’s History Museum and Maine Memory Network as useful because the exhibitions and the website in general are created for them. An adult who finds an interest in women’s history might not be as comfortable with technology as students. However, Hung et al., (2013) hypothesizes “a user’s personal innovativeness has positive effect on his/her perceived usefulness of digital museums.” Since adult visitors have a personal investment in discovering more about a topic, NWHM and MMN have a perceived usefulness which will help drive the adult visitor farther into the exhibitions.

Audience Engagement Evaluation

Rhizome’s audience are artists creating born-digital artworks, and those looking to preserve those works. Traditionally, websites evaluate their audience engagement through the number of clicks on a page. Rhizome abstains from such evaluation instead choosing to evaluate audience engagement through constituent responses (Kaplan, 2018). Rhizome analyzes if it is receiving critical mentions throughout the industry, if artworks are being used in other exhibitions, and if scholarship that Rhizome produces is being used in other scholarship (Kaplan, 2018). Through continual research, Rhizome can emphatically say that it is indeed meeting its audience’s needs and expectations based on the three criteria mentioned above. Rhizome pragmatically surveys the artist field to determine how core constituents feel about Rhizome’s work, if exhibitions are influential, and if the community feels represented and supported. The
number of visitors to Rhizome’s website is not what drives the institution. Rhizome determines its success based on its meaningful contributions to the field of born-digital artwork, support of digital artists, and subsequent artwork preservation.

National Women’s History Museum has two main audiences. The first is Teachers/Students – students 4th through 11th grade and history teachers. These constituents are reached through digital outreach efforts. Students are reached through efforts such as a digital field trip series done through Google Hangout and live digital programming such as signing up for live chats with a historian for school projects (Maurer, 2018). To reach teaching constituents, National Women’s History Museum creates teaching resources such as access to primary sources, posters and children’s books. The second audience is Adult History Aficionados (Maurer, 2018). Adult History Aficionados are “mostly women” who are interested in history (Maurer, 2018). This interest normally stems from either an interest in “vintage” or “retro” items or someone who identifies as a history enthusiast (Maurer, 2018). Typical content for this audience is very broad but very often tied into popular culture such as “the Olympics or a history of women and shopping” (Maurer, 2018). National Women’s History Museum reaches out to these constituents online through a monthly email newsletter and Facebook Live. Social media is a prominent part of NWHM’s outreach program efforts because it can quickly move content through social media and reach a large population.

National Women’s History Museum uses the Search Engine Optimization strategy to reach members from both target audiences. Search Engine Optimization strategy is when an institution selects key words that it thinks are of interest to a particular audience. Content clusters, which are several pieces on a related topic, are created based on those key words. These content clusters are then placed on a “landing page” and internally linked (Maurer, 2018).
Google awards “higher domain authority” to websites with content clusters (Maurer, 2018). This strategy raises NWHM’s results in an organic search and increases the page click rate through visibility. This is the main strategy behind National Women’s History Museum’s success in engaging its audience.

To analyze audience engagement and general success, National Women’s History Museum looks at the website analytics. These analytics are able to tell the museum the numbers of clicks on a page, repeat visits, the amount of time on the website, and the bounce rate which is when a visitor only looks at a single page of the website during their visit. However, website analytics does not provide information about learning; what a visitor learned or how a visitor changed by engaging with the website. To bridge this gap, National Women’s History Museum uses online surveys to ask visitors opinions. The museum also used focus groups when designing its new website. National Women’s History Museum also analyzes the numbers and narrative evaluations for teacher outreach and feedback. Maine Memory Network also takes a more traditional approach when analyzing audience engagement and success.

The main audience of the Maine Memory Network is the general public, educators and school children, and researchers (Amoroso, 2017). Maine Memory Network generates user statistics based on website traffic and evaluates success by comparing the new traffic patterns to patterns in the past. Maine Memory Network can track clicks on items, but does not track repeat visitors (Rice, 2018). Recently, MMN began looking at the path visitors use to get to the website (Amoroso, 2018). Maine Memory Network uses Google Analytics to evaluate audience engagement but does not utilize all of Google’s features (Amoroso, 2018). Maine Memory Network uses Google Analytics “for users, page views, session statistics, and to see which pages are most popular” (Amoroso, 2018). Recently, MMN began looking at trends from data dating
back as far as 2006” (Amoroso, 2018). Maine Memory Network has “determined that over 10% of users are accessing MMN from a mobile device” which allows MMN to know what type of interfaces to target its audiences through (Amoroso, 2018). There is also a staff member who works closely with schools and teachers and is able to “unofficially hear” how visitors are using the website and how effective the website seems to be to visitors (Amoroso, 2018). Maine Memory Network has developed a way to continuously advance itself with impressionistic feedback. At times, this can be an excellent evaluation strategy because it provides feedback in real time with boots on the ground. Maine Memory Network is looking to establish goals which can then be used to create standards for evaluation (Rice, 2018). Even without a standardized evaluation process, MMN continues to provide useful resources to its constituents and gains support from contributing partners, the general public, and educators.

Hung et al., (2013) emphatically emphasizes “the increase perceived usefulness and perceived ease of use can potentially help digital users form more positive attitudes and intention towards [virtual museums] prior to their initial interaction. As a consequence, the actual use of digital museums should increase.” National Women’s History Museum and Maine Memory Network have increased their perceived usefulness to users because both museums are aimed at two distinct audiences and work to make each interaction concise within the needs of each audience. Maine Memory Network and Rhizome aim to support a certain audience as well as continue to develop practices in the field. The work the museums do on software or digitization skill development shows users their long-term dedication and usefulness as a virtual museum.

Conclusion

Over the last century, museums have evolved “from being about something to being for somebody” (Weil, 2002). Gone are the days of “museums as a repository to store rare objects” (Hung et al., 2013). Instead museums are “inspiring individual growth and promoting culture
awareness and societal enrichment” (Hung et al., 2013). Virtual museums have grown with this idea too but have had to adapt to different virtual challenges along the way. The three virtual museums in this study survived due to their determination to fix a growing need in the industry. Rhizome champions born-digital art and provides a continuous home for pieces that would not otherwise have one, both through Artbase and the free archiving platforms for other institutions. National Women’s History Museum saw the need to educate the population on a vastly overlooked topic and did so through an avenue that was able to create a national audience and create sustainability. Maine Memory Network saw the need to also educate a population on an important subject but sought to do so by providing digitization skills to other museums in order to continue the practice of accessibility in museums. Each virtual museum found a niche to grow a business and strategic plan but continue to navigate sustainability. Two museums pushed the boundaries of digital preservation. One museum diversifies virtual exhibitions. All three virtual museums look to actively engaged their audience.

Further research on this topic can include the benefits of the practices and skills taught by virtual museums. Rhizome and Maine Memory Network set an example for and teach skills to other museums to help them on their digitization path. In a few years, further research can be done to see how these practices and skills have impacted other institutions in their digital endeavors.

Further research can also be done on the psychological perception and acceptance of virtual museums, both from physical museums and from virtual museums themselves. Throughout the research and analysis process the idea of institutional self-esteem continued to arise. Rhizome was the only virtual museum that was boisterously proud of its virtual accomplishments. National Women’s History Museum seems to be using its museum as a means
to an end and Maine Memory Network did not seem proud of the fact that it was virtual. The first interview conducted with MMN gave off the impression that it was just a project that worked out quite well. These institutional attitudes could be the interpretation of the individual interviewed, the place of the virtual museum on its road to sustainability, or a general perception of virtual museums within the cultural heritage realm. Whatever the case may be, further research about subconscious cultural heritage perceptions of virtual museums could provide insight into the slow development of sustainable business models for virtual museums. Even though all museums today have to have some kind of digital presence, how seriously are virtual museums taken by the cultural heritage community and even amongst themselves?

To combat the idea of worthiness, virtual museums can begin to hold themselves to basic foundational standards. These basic standards come in the form of institutional documents and practices and should include: a business plan with a strategic plan that highlights the route to sustainability, a risk-assessment analyzing whether or not the digital collection could be reassembled if lost and at what cost, preservation strategies for high-value collections, an educational platform and audience engagement strategies, and a succession plan. All of these aspects take copious amounts of time and effort on the part of the staff, but together the documents lead to a virtual organization that can maintain and interpret the new media of history that is being created right now.
Works Cited


Maurer, E. (2018). Director of Programs at the National Women’s History Museum. Personal Correspondence.


Rice, J. (2018). Director of Library Services and Head of Research and Scholarship Department at Maine Historical Society. Personal Correspondence.

Walters, T. O., & Skinner, K. (2010). Economics, sustainability, and the cooperative model in
doi://dx.doi.org/10.1108/07378831011047668.
Appendix A: Rhizome

Net Art Anthology

Rhizome’s main exhibition platform, which is easily accessible to users, is Art Net Anthology. Art Net Anthology uses multiple platforms within one exhibition.

Figure 1

This two-year online exhibition will present 100 artworks from net art history, restaging and contextualizing one project each week.

Devised in concert with Rhizome’s acclaimed digital preservation department, Net Art Anthology also aims to address the shortage of historical perspectives on a field in which even the most prominent artworks are often inaccessible. The series takes on the complex task of identifying, preserving, and presenting exemplary works in a field characterized by broad participation, diverse practices, promiscuous collaboration, and rapidly shifting formal and aesthetic standards.

Net Art Anthology is a multi-layered large exhibition that begins with a traditional vertical webpage (Figure 1). As users scroll down they then see clickable options for each exhibit (Figure 2).

Figure 2
Once an exhibit has been selected, multiple platforms, such as text, pictures, and other links appear in the exhibit (Figure 3 and 4).

Figure 3

Heritage Gold (1997) was a hack of Adobe Photoshop in which the software's standard image editing tools were relabeled as tools for altering race and social class, in a kind of parodic racial engineering.

The work was one component within the multi-platform project National Heritage (1997-1999) by UK-based collective Mongrel. Shown in gallery exhibitions, Heritage Gold also circulated on floppy disks and on internet bulletin boards alongside other cracks and

Figure 4

Through Artoc, the members of Mongrel and their community gained access to the nascent world wide web, which had been advertised as a radical research and communication tool. Upon encountering it, they were disheartened to find that the presence of far-right white supremacist content was overwhelming and that the net featured very little that spoke to working class or black users.
Some exhibitions also incorporate emulation software. The exhibit, *Heritage Gold*, uses emulation to help users see how the virtual exhibit was designed and accomplished (Figures 5 and 6). This form of emulation is different than what Rhizome produces on its website, oldweb.today. Oldweb.today allows users to use different browsers to see how websites looked in the past. *Heritage Gold* is allowing users to see the exhibit design process through emulating different applications on a computer.

Figure 5

![HERITAGE GOLD](image)

Figure 6

![HERITAGE GOLD](image)
Rhizome also provides access to Artbase, although it is no longer accepting new pieces. Artbase takes users to a database in which users can search for a piece of art either by date, artist name, or title (Figure 7). Below the search bar is a list of the artworks in Artbase. Users can also simply click on a piece of art. The artwork link takes visitors to another webpage which gives a small overview of the artist and the artwork. An additional link takes visitors to the artwork which is in a vertical webpage style (Figure 8).
Figure 8

John Russell

\[ \text{SQRRRL} \]

‘... if your only love is for eternity, why stay on this earth? If pleasures and mortifications, for you, are perpetually bound together, why don’t you give up living? If birth amounts to a beginning of death, why drag out the agony?’

Lionel Trigges
Aberdeen Lever
Appendix B: National Women’s History Museum

Google Arts and Culture

National Women’s History Museum uses three platforms for its exhibitions: Google Arts and Culture, Prezi, and Timeline JS. The Google Arts and Culture templated platform is used to create exhibitions which are then embedded into the NWHM website. Visitors click on the link to the exhibit of their choice which then takes them to a webpage with the title of the exhibition and a link to the Google Arts and Culture page (Figure 1). Visitors can then click on the link to see the full exhibit in Google Arts and Culture, which is in a webpage style (Figure 2).

Figure 1
The Sustainability and Preservation of Virtual Museums

Figure 2

Women immigrants have played a dynamic role in transforming America socially, politically, and economically.

A Woman's Story

Though women are integral characters, immigration is rarely thought of as a woman's story. Women historically have accounted for almost fifty percent of immigrants and currently exceed that. Women's motivations for migration have been varied and complex. Gender has influenced migrant women's choices to immigrate as well as their opportunities and
Prezi

National Women’s History Museum also uses Prezi as an exhibition platform (Figure 3). Prezi is a storytelling presentation software used as an alternative to traditional slideshow presentations. Rather than a vertical webpage presentation, such as with the Google Arts and Culture, Prezi enables visitors to see an overview of the topic, easily pan between topics, zoom in on details, and return to the full overview to reengage with the whole context (Figures 4 through 6). This engagement makes Prezi a more interactive platform for the audience.

Figure 3
Figure 4

Helga and Clara Estby
1860-1942; 1877-1950

1896

Figure 5

1896

Helga and Clara Estby left their home in Spokane, Washington on May 5, 1896 in an attempt to walk across the country. The Estby’s were on the verge of bankruptcy and their farm was about to be taken away. A $10,000 reward was promised upon the pair’s completion of the walk. The two women arrived in New York City in December 1896. They never received their reward.

The Estby’s approximate route
Figure 6

Timeline JS

National Women’s History Museum’s favorite exhibit platform is a slideshow/timeline platform called Timeline JS (Maurer, 2018). Timeline JS does not involve any coding on the curator’s end of the exhibit. The timeline is a spreadsheet derived from a Google Doc. The exhibit curator enters the date, text, and link to the image online (which is also in a Google drive folder) into a Google Doc. Timeline JS then pulls all the fields from the Google Doc and creates the exhibit timeline (Figures 7 and 8). Timeline JS also allows users to embed videos, the platform is easy to update, and works well with mobile devices.

Figure 7
Figure 8

Los Angeles, 1932

Early Champions

Babe Didrickson Zaharias was an accomplished athlete in many sports, including baseball, golf, and track and field. In 1932, she was disqualified in the high jump for improper technique, even though she would have come in first place. Fortunately, she was successful in other events, and won gold and silver medals in running, throwing, and jumping events.
Appendix C: Maine Memory Network

Maine Memory Network’s Sitebuilder creates exhibitions in a webpage style. The exhibitions webpage has links to a multitude of exhibitions. These links take visitors to another webpage which gives an overview of the topic with multiple links to different exhibits (Figure 1). Visitors can then click on the additional links to view the smaller exhibits. Exhibits can be viewed in a slideshow format (Figure 2) or a list view format (Figure 3).
Figure 2

Compared to the average size lobster in his left hand, Carl A. Merrill Jr. (1959-1982) displayed an unusually large lobster for Portland newspaper photographers. For a sense of proportion, Mr. Merrill was listed as five feet, nine inches tall on his WIC draft registration card.

Carl Merrill, Jr. was a Portland tradesman, working at 224 Federal Street during the period.

In this color postcard, Lewis Kelsoy Sr. shows his grandson Lewis Kelsoy how to coil the lines that attach to the wooden lobster traps stacked behind them in the western Gut, South Bristol. Wood was the traditional material for lobster traps but those are no longer in use. Wooden traps have been replaced by wire traps that are easier to maintain and last longer.

Wooden lobster traps, South Bristol, ca. 1970

Item 76552 (17)
South Bristol Historical Society
The Sustainability and Preservation of Virtual Museums

Figure 3

Canning: A Maine Industry

1.

The Wilson brothers of Portland were among the first canners in the United States, and canned corn was their first product. The process pioneered by the Wilsons involved packing corn in a can, heating the can to kill bacteria, and then sealing it. This allowed the corn to remain edible and retain its flavor. By 1852, their nameplate -- Wilson's Patent Hermetically Sealed Green Corn -- had gained commercial success.

2.

George S. Jewett worked in the corn canning industry throughout his life. Born in 1836, Jewett’s first job was in the Wilson corn factory in Portland, the first corn factory in Maine.

At left is George S. Jewett’s son, George H. Jewett.

3.

After learning the industry with the Wilsons, Jewett moved to Norridgewock where, around 1885, he became superintendent of the local Burnham and Morrill (B&M) Corn Factory. The industry thrived during this time and Jewett held this position for twenty-three years.

4.

After his time working for B&M, Jewett decided to set out on his own. In 1910, he built or purchased several corn canning factories, most of which were in Somerset County. His largest was in Norridgewock.