

Immersion in Museums: AR, VR, or Just Plain R?

a primer for attendees



Prepared by the American Alliance of Museums



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Introduction to this Convening

Some have said that it's possible to travel the world in an afternoon without ever leaving the galleries of your favorite museum. Certainly, many of us have experienced losing ourselves amidst fantastic objects and stories that transport us to other places and times.

With the maturation of digital technologies like augmented and virtual reality (AR, VR), museums are on the cusp of creating increasingly compelling virtual experiences that extend the reach and possibilities of what a museum might become. These virtual experiences can refresh and personalize the museum space, as well as extend museums' reach beyond their physical walls to reach and engage new audiences. A new class of "born digital" AR and VR art challenges museum staff to develop new practices for collection, preservation and rights management.

At the same time, our visitors are increasingly concerned about the dangers of privileging digitally mediated experiences over "real time" spent with friends and family. We observe that the social experience of museum-going is frequently cited as among the top motivations for visiting at all. We know that museum visitors value the authenticity of the "real thing" and despite the influences of a visually-laden social media culture, the interest and dedication of audiences to hyper-local, artisanal, and delicately nuanced physical experiences hints at a desire for the real over the virtual.

Witness the contemporaneous popularity of physically constructed immersive experiences like Meow Wolf in Santa Fe, the City Museum in St. Louis, and exhibitions like Wonder at the Renwick Gallery. What are the potential futures of digital and physical immersion in museums and how can we begin to think strategically about the nuances that define the boundary between the physical and the virtual? How can museums create compelling experiences for visitors that effectively engage them with the subject, while creating compelling and memorable experiences that can be shared with friends and family?

This primer presents an overview of the terminology, history, and current practice in immersion. We look forward to exploring these questions with you at the Detroit Institute of Arts on September 6-7, 2018. Please bring your own, thoughts, questions, and provocations to share with your colleagues at this dynamic convening.

Introduction to Immersive Experiences

In the past decade we have seen the maturation of a number of digital technologies that provide immersive experiences. Augmented reality (AR) adds digital information to the real sensory input from the world around us—pasting content and information on top of what we see or hear, and at its most sophisticated, interacting with and adapting to the user. Mixed reality (MR) overlays but anchors virtual objects to the real world. Virtual reality (VR) refers to media that transport a user to a wholly digital, simulated environment—an imaginary world, or a recreation of the real world, present or past.

Of course, there are many ways to create immersive experiences “In Real Life” (IRL) without the use of digital technologies. Many place-based immersive projects simply co-opt the sensory landscape where they take place. One trending form of IRL experience is immersive theater, in which the audience moves through a staged environment at their own pace, choosing their own path and sequence for observing pieces of the performance. The current popularity of immersive theater was sparked in 2011, when Punchdrunk Theater premiered *Sleep No More*, an award-winning adaptation of *Macbeth* staged in a warehouse complex in Chelsea. A growing number of museums (documented in this [Google Spreadsheet](#)) are partnering with theatrical companies to create immersive presentations designed for their own unique spaces.

Augmented Reality

For a timeline detailing the history of augmented reality, please see "The Mainstreaming of Augmented Reality: A Brief History" by Ana Javornik from Harvard Business Review:

hbr.org/2016/10/the-mainstreaming-of-augmented-reality-a-brief-history

Virtual Reality

For a more context about the history of virtual reality, please see "History of Virtual Reality" from the Virtual Reality Society:

www.vrs.org.uk/virtual-reality/history.html

Key Terms

All Key terms have been pulled from the VR Glossary. The selection below includes the terms that are most likely to be referenced during the meeting. For more AR and VR vocabulary, please visit www.vrglossary.org.

Analytics

The information resulting from the systematic analysis of both events occurring within the artificial reality and of the device being used to create the artificial reality.

Augmented reality (AR)

In augmented reality (AR) the visible natural world is overlaid with a layer of digital content

Avatar

A virtual representation of the experiencer within the virtual world

Data glove

An interactive device – often resembling a glove worn on the hand – which connects to a computer system and facilitates fine-motion control within virtual reality

Embodied presence

Acknowledging the existence of your body within a virtual reality VR experience

Eye tracking

The ability for ahead mounted display (HMD) to read the position of the experiencer's eyes versus their head. Eye tracking is particularly useful for informing VR analytics, where the developer wants to better understand what content the experiencer is focused on in a specific scene or view.

Gesture

Form of non-verbal communication through the body – typically the hands or head – that, when tracked by a motion sensing camera attached to a computer, can be interpreted as movement and mirrored in virtual reality.

Haptics

Haptic technology simulates the sense of touch through the sensation of pressure (usually on the hands via a glove)

Key Terms Continued

Head mounted display_(HMD).

A set of goggles or a helmet with tiny monitors in front of each eye to generate images seen by the wearer as three-dimensional

Mixed reality_(MR).

Mixed reality is similar to augmented reality (AR) except virtual objects are integrated into the natural world

Peripheral

A device that helps enhance a virtual reality experience by enabling greater immersion within the virtual world

Positional audio

Audio that is triggered based on the position of the headset

Signposts_(signposting).

Environment cues with the added purpose of helping the user to interpret the virtual environment

Virtual reality_(VR).

Virtual reality places the experiencer in another location entirely. Whether that location has been generated by a computer or captured by video, it entirely occludes the experiencer's natural surroundings.

Virtual reality sickness

(Also known as: 'motion sickness' or 'simulation sickness')

is the feeling of general discomfort caused by experiencing virtual reality. Symptoms can include: headache, nausea, vomiting, drowsiness, and disorientation.

For related infographics please see "Virtual Reality Infographics" by the Virtual Reality Glossary:

www.vrglossary.org/infographic

Contemporary Readings and Resources

For additional resources please see the abstracts and links listed below. These articles are not indexed in the appendices.

MuseoPunks

MuseoPunks 2-part podcast on VR, 'Virtually Yours'

To listen or download the podcasts, please use the links below.

Part 1: soundcloud.com/museopunks/episode-28-virtually-yours-part-1

Part 2: soundcloud.com/museopunks/episode-29-virtually-yours-part-2

For additional information about each podcast including the co-hosts' bios, podcast notes, and links to additional information, please visit: labs.aam-us.org/museopunks/

TrendsWatch 2016

Me/We/Here/There: museums and the matrix of place-based augmented devices, Pages 23-29

www.aam-us.org/2016/05/01/meweherethere-museums-and-the-matrix-of-place-based-augmented-devices/

CFM and Alliance Blog Posts

Six Tips for Making Virtual Reality a Reality, 2017

www.aam-us.org/2017/11/13/what-we-learned-6-tips-for-making-virtual-reality-a-reality/

Experiments in Virtual Reality at The Museum of Flight, 2016

www.aam-us.org/2016/02/23/experiments-in-virtual-reality-at-the-museum-of-flight/

Playing in the Museum Sandbox (Australian Museum of the Moving Image), 2016

www.aam-us.org/2016/09/20/playing-in-the-museum-sandbox/

Exploring the Sixth Extinction through Immersive Theater (Carnegie Museums of Pittsburgh), 2017

www.aam-us.org/2017/12/19/exploring-the-sixth-extinction-through-immersive-theater/

Contemporary Readings and Resources Continued

Dispatches from the Center for Museums

These are links and abstracts to additional articles from CFM's weekly e-newsletter [Dispatches from the Future of Museums](#). These articles are not indexed in the appendices.

PEMcast podcasts on Immersion

www.pem.org/explore-art/pemcast

PEMcast 010: Immersive experiences | Part 1

Museums and artists have long played on people's sense of empathy and wonder. But now, more than ever, museums are incorporating all the senses in exhibition design and in the design of the whole museum. Interviews include Deborah Vankin of the LA Times, and curator Daisy Wang discussing physical immersive experiences, like historic houses.

PEMcast 011: Immersive experiences | Part 2

How can museums heighten a sense of empathy and wonder? Increasingly immersive environments and multi-sensory experiences are coming into play. Tune into the most recent installment of the PEMcast as we explore the immersive experience with 3D sound designer Jason Reinier, designers and users of the VR game *Beyond Solitary*, and live action role play (LARP) designer Johanna Koljonen.

MoMA R&D Salon 5: Immersion and Participation

momarnd.moma.org/salons/immersion-and-participation/

Immersion and Participation dissected the interplay of immersion, interaction, participation, technology, and innovative communication, especially as they pertain to museums. Immersion evokes total envelopment, the plunge into a separate, all-encompassing physical or mental space. Artistic practice is deeply connected to this idea, and so too can be the experience of engaging with art. Viewers can be transported by their exposure to a work, even overcome by a Stendhal Syndrome-like vertigo. Museum galleries can similarly be conceived as immersive experiences that transport the visitor out of everyday life.

Contemporary Readings and Resources Continued

Participation, however—exchange, interactivity, commitment—has become the Holy Grail for most museums and for many designers, architects, and artists. The concept is not new, but recent technological innovations have enabled experiments with enhanced storytelling techniques, and have also introduced a demand for more complex, involving, and multi-sensorial experiences on the part of the audience.

Recent Stories in the News

New Virtual Reality Art Exhibit Brings Sea Level Rise to Times Square

Earther, 7-12-18

earther.com/new-virtual-reality-art-exhibit-brings-sea-level-rise-t-1827541612

Times Square now contains a new art exhibit—featuring virtual reality elements and a 60-foot physical installation—dedicated to climate change. Launched Wednesday, the exhibit titled “Wake” and “Unmoored,” was born from artist Mel Chin’s vision. “All Over the Place,” a riveting and contemplative exhibit of his, is currently on display at the Queens Museum in New York City. “Wake,” [is] a shipwreck that features the skeletal remains of a large marine mammal resembling a whale alongside 21-foot tall robot-like object inspired by an opera singer’s figurehead that was once mounted on the USS Nightingale, a 19th century slave ship that could once be found in the waters surrounding New York City. “Unmoored,” [is a] virtual reality component that throws participants into a bleak future where humanity has lost the battle against climate change.

Denver Museum of Nature & Science Opens Virtual Reality Arcade

Westword, 7-10-18

www.westword.com/arts/denver-museum-of-nature-and-science-opens-virtual-reality-arcade-10521242

On July 9, the Denver Museum of Nature & Science unveiled its latest addition, a virtual-reality arcade that will transport people of all ages around the world and even to Mars without ever actually leaving the museum. The museum built the facility

Contemporary Readings and Resources Continued

itself, while the ten games available come from outside companies. At each station in the arcade, a user wears audio-equipped goggles and holds two controllers, then takes off into a new reality. The arcade is open daily from 10 a.m. to 5 p.m.; after paying museum admission, adults can pay \$10 and junior guests (ten and up) \$9 for ten minutes of gaming time.

Snapchat Lenses bring coral reefs to your neighborhood

Engadget, 6-19-18

www.engadget.com/2018/06/19/coral-reef-snapchat-lenses/

How do you make nature exciting to a generation growing up with Snapchat and Instagram? The California Academy of Sciences has an idea: bring the nature to the apps that generation is using. It just trotted out a series of augmented reality Snapchat Lenses (the first of their kind, CAS said) that show reef life in your own corner of the world. You can get up close to creatures like sea turtles, nudibranches and moray eels without having to put on some diving gear or incurring the wrath of conservationists.

Anne Frank House museum unveils virtual reality tour

Star Tribune, 6-12-18

www.startribune.com/anne-frank-house-museum-unveils-virtual-reality-tour/485251491/

The Amsterdam museum dedicated to Anne Frank's life launched a virtual reality tour of the cramped quarters where the Jewish diarist and her family hid from Nazis during World War II, marking what would have been her 89th birthday Tuesday. The Anne Frank House said the 25-minute tour means people won't have to visit the museum to see the annex where the Franks and four other Jews hid from July 1942 until they were discovered in August 1944 and deported to concentration camps. People with restricted mobility who visit the Amsterdam museum but cannot tour the small rooms will now be able to experience them in virtual reality. The VR experience will be rolled out to Anne Frank centers in Berlin and New York later this year.

Contemporary Readings and Resources Continued

The death of the art gallery? Japan's new digital museum may offer a glimpse of the future

The Telegraph, 6-12-18

www.telegraph.co.uk/travel/destinations/asia/japan/articles/tokyo-digital-art-museum-review/

Mori Building Digital Art Museum: teamLab Borderless, which opens June 21, fortunately has a concept which is a bit catchier than its name: the world's first digital museum of its scope and scale, it's a new generation showcase of immersive, interactive digital art created by teamLab, a fast-growing Tokyo collective of so-called "ultra technologists". It's home to 50 artworks loosely divided into five areas, orchestrated by a complex network of 520 computers and 470 high-tech projectors. Upstairs is a space guaranteed to become children's nirvana: "Athletics Forest", a sprawling, stimulating 3D haven which, according to Inoko, was scientifically designed to promote the growth of the brain's hippocampus.

A New Breed of Immersive Art Experiences Offers a Gateway to Alternative Realities

Artsy, 5-21-18

www.artsy.net/article/artsy-editorial-new-breed-immersive-art-experiences-offers-gateway-alternative-realities

[Vince] Kadlubek is the CEO of Meow Wolf, an artist collective and production company that creates large-scale, interactive, multimedia installations. It brought in \$6 million in revenue during its first year; Meow Wolf has plans to build two more unique spaces in the next two years, in Las Vegas and Denver. This momentum speaks to the broad appetite for experiential art at present—from immersive exhibitions, like those of Yayoi Kusama, to Instagram-friendly "museums," like the Museum of Ice Cream—particularly among experience-hungry, selfie-loving millennials. Meow Wolf, however, aims to offer more than just photo ops. Rather, Kadlubek and his colleagues are working towards a future where high-quality, thought-provoking art environments are the norm.

Contemporary Readings and Resources Continued

Modigliani VR: The Ochre Atelier

www.tate.org.uk/whats-on/tate-modern/exhibition/modigliani/modigliani-vr-ochre-atelier

Go behind-the-scenes and discover how we recreated the artist's final Parisian studio in virtual reality. The Modigliani VR: The Ochre Atelier reimagines Modigliani's final Parisian studio, where he lived and worked in the final months of his life in 1919 and 1920. A previously undocumented space, the artist's studio has been brought back to life through more than 60 objects, artworks and materials.