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Editor's note:

In "Doing Our Part" in the July/August 2022 issue of *Museum*, Ex-cel PVC Free Foam sheet was listed as a PVC-free print and mounting substrate. This is incorrect; the product contains PVC. We regret the error.

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Museums and the Digital World

As the mother of a 10-year-old in 2022, I witness some fascinating scenes. Increasingly, my daughter prefers to spend much of her free time in intricate virtual worlds she's created for herself, usually in games like Minecraft and Animal Crossing. Though the depth and imagination of these worlds can be impressive, I'm sometimes bewildered by her devotion to them. Wouldn't she rather be playing real tennis with her friends who live only miles away rather than meeting them in a video game for virtual tennis?

In a way, museums have been in the same position for the past few decades as they've watched their audiences' digital appetites grow. More of our personal and professional lives have begun to take place online, a trend that for-profit industries are betting will only accelerate in the future. Yet most museums have been slow to embrace this new world, due to a combination of capacity issues and concern that doing so would undercut their value as in-person, physical experiences.

That was the case until the pandemic arrived, when suddenly the value of digital investment became a lot starker, even to traditionalists. Most museums hastened to create virtual programming to replace in-person engagements, and while many successes resulted, the rapid push also revealed gaps in the field's infrastructure to create the illuminating, inclusive digital experiences it aimed for.

As the fervor of early pandemic pivoting reduces to a slower, more thoughtful turn, museums are considering how to invest in this capability in the long term. More in our field understand that virtual access is enhancing their missions rather than muddling them, particularly as it engages audiences who are unable or hesitant to visit in person. We are beginning to see that the audience that can benefit from our work is much broader than the one that can come through our doors.

This potential for greater accessibility and inclusion is compelling but complicated by issues like the gap in access to technology and inconsistent practices for visual and auditory accessibility. Museums also need to consider the economics of investing in digital experiences, which can be expensive to produce and difficult on which to yield a financial return.

Not every museum can or must approach the digital realm in the same way, going feet-first into whatever new technology emerges. Instead, they should pick and choose the things that make the most sense for their communities, business needs, values, and priorities.

At AAM, our own digital journey has accelerated as much as our members'. Since the start of the pandemic, we have increased our output of digital content and resources and conducted many of our long-running programs remotely, such as the Annual Meeting, Accreditation, the Museum Assessment Program, and Museums Advocacy Day, which returns in person in February.

As a result of all this adaptation, we've committed to refining our long-term digital strategy with the goal of reaching you with the information and inspiration you need to do your best work, wherever and whenever you may need it most. Gone are the days when technology was a minor function relegated to just a few departments of an organization. It now penetrates into all of our work and likely will be at the center of some of our greatest potential going forward.

9/8/2022



A handwritten signature in black ink that reads "Laura Lott".

Laura L. Lott is the Alliance's President and CEO. Follow Laura on Twitter at [@LottLaura](https://twitter.com/LottLaura).

The Digital Evolution

85%

Percentage of US adults who report that they go online at least daily.

Adults over 60 were **1.6x** more likely to engage in virtual content from museums than adults under 40.

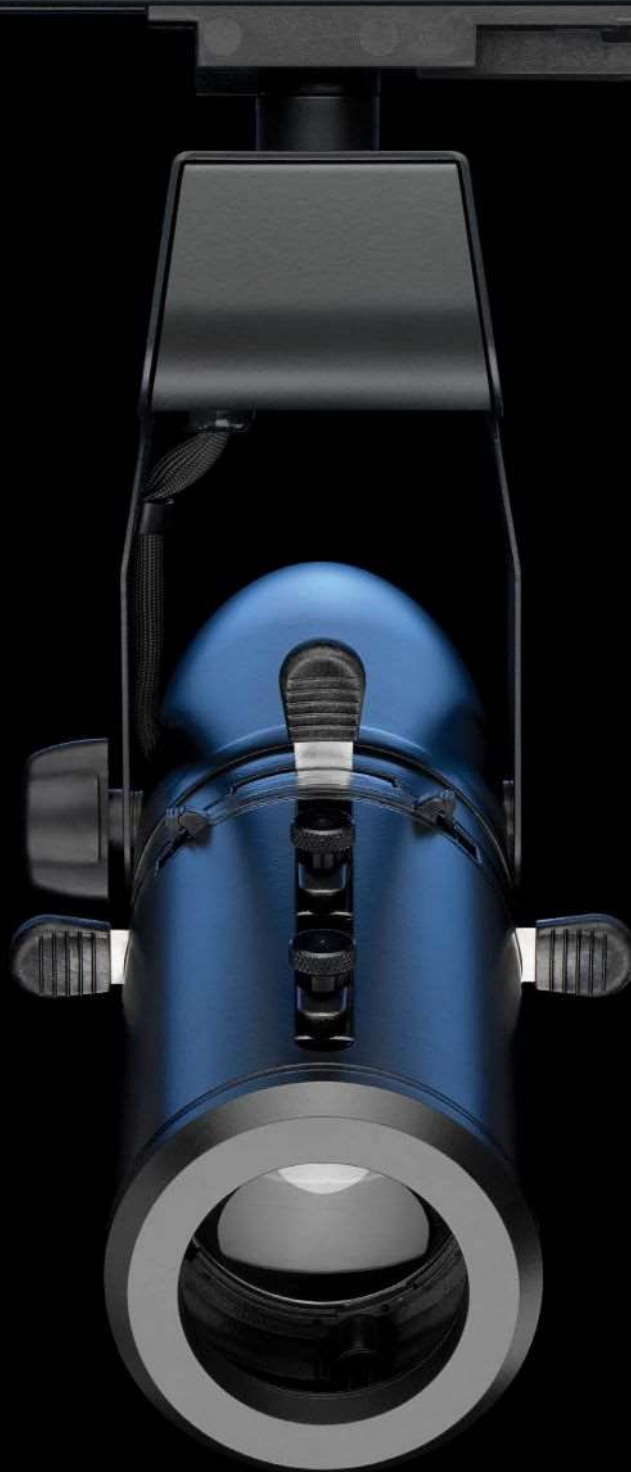
13%

Percentage of frequent museum-goers who enjoy using their phone to access more information or apps during museum visits.

5 different companies installed **nearly 50** immersive Van Gogh experiences in the US in 2021.

Sources: Clockwise from top left: Pew Research Center; 2021 Annual Survey of Museum-Goers; Artnet News; 2022 Annual Survey of Museum-Goers

By the Numbers was compiled by Susie Wilkening, principal of Wilkening Consulting, wilkeningconsulting.com. Reach Susie at Susie@wilkeningconsulting.com.



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Jule Collins Smith Museum of Fine Art at Auburn University

“Overboard” features nearly 250 sculptures by Andy Yoder riffing off Nike Air Jordan 5s. One of the most recognizable athletic shoes in contemporary culture, this model became popular in 1990. That same year, more than 80,000 pairs of those Nike shoes and work boots fell into the Pacific Ocean en route to the US from South Korea, prompting Dr. Curtis Ebbesmeyer’s groundbreaking study of maritime currents. Using unique serial numbers, researchers gathered data from beachcombers worldwide who found the shoes.

Location: Auburn, AL

Dates: through April 1, 2023

Learn more: jcsmauburn.edu/exhibitions/overboard/



San Luis Obispo Museum of Art

The San Luis Obispo Museum of Art and the city of San Luis Obispo will coordinate various public art projects for the next two years as part of the Art in Public Places Program. The program helps maintain San Luis Obispo’s community identity, connecting community members and visitors to the city’s shared history and cultural heritage. Currently, the program consists of more than 70 unique pieces of art, ranging from murals, mosaics, oil and watercolor paintings, utility box art, stained glass, sculptures, benches, bridge railings, and more.

Location: San Luis Obispo, CA

Learn more: sloma.org/exhibits/public-art/

Museum of Fine Arts, St. Petersburg

“Multiple: Prince Twins Seven-Seven” showcases the visionary world of Prince Twins Seven-Seven, the only surviving child out of seven pairs of twins born to his mother. Blending abstracted images of the physical world and evocations of the spirit world, the artist created a unique, powerful, and international style that bridges traditional and contemporary arts and repudiates the frequently misconceived division between the traditional and contemporary in African art.

Location: St. Petersburg, FL

Dates: through Jan. 15, 2023

Learn more: mfastpete.org/exh/prince-seven-seven/

Andy Yoder, Auburn, courtesy of the artist, photo by Mike Cortez; Heraldo Creative Studio; Twins Seven-Seven, Green Painting (detail), before 1975

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This issue of *Museum* is all about the digital universe. For more inspiration, browse companies offering services in these categories:

[Audio/Visual Products & Services](#)
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[IT Products & Services](#)
[Master Planning](#)
& more!

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Sigal Museum

"Easton Nights at the Sigal Museum" features over 70 photographs by Peter Ydeen that explore his major photography concentration: a series titled "Easton Nights." The exhibition tells a story that grew from the unique and uncommon valley in which the city lies, conveyed with images of unpeopled landscapes taken at night. Here, in the small hours, the world we see as mundane cascades into dream.

Location: Easton, PA

Dates: through May 28, 2023

Learn more: sigalmuseum.org/exhibits/

Montclair State University Galleries

"Nothing Under Heaven," Joseph Liatela's first solo museum exhibition, brings together new commissions and recent works that explore the need for connection, pleasure, and agency within oppressive systems. Exhibited alongside photography by Andy Warhol and religious art by Carlo Dolci from the University Galleries' collection, Liatela invokes a range of stories to assess what it means to move together, remember together, and repair together.

Location: Montclair, NJ

Dates: through Dec. 9

Learn more: montclair.edu/galleries/exhibitions/nothing-under-heaven-by-joseph-liatela/

UCI Jack and Shanaz Langson Institute and Museum of California Art

Featuring two artworks commissioned expressly for the exhibition, "Dissolve" explores how 12 contemporary artists perceive what it means to change from one form to another. Through painting, photography, sculpture, installation, and video, the artworks demonstrate how gradual and immediate changes impact viewers' perceptions of self, one another, and the shared environment.

Location: Irvine, CA

Dates: through Dec. 10

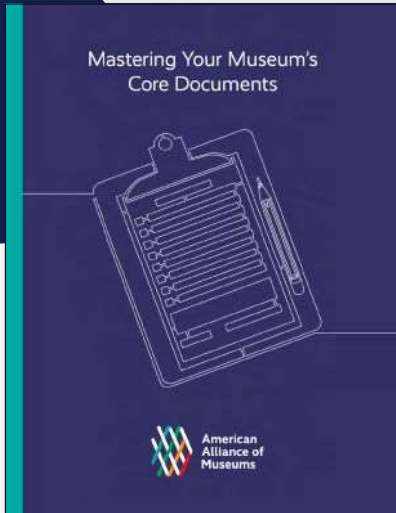
Learn more: imca.uci.edu/exhibition/dissolve/

What's New at Your Museum?

Do you have a new temporary or permanent exhibition, education program, partnership/initiative, or building/wing? Tell us at bit.ly/MuseumNewsAAM, and it might be featured in an upcoming issue.

Peter Ydeen, *Sleep*, May 18, 2019; "To Move Is To Remember," 2022, dancers: Héctor Cerna and Chris Tabassi, photo by Whitney Browne; Sonia Romero, *Inner Landscape*, 2011, The Buck Collection at UCI Institute and Museum of California Art © 2011 Sonia Romero

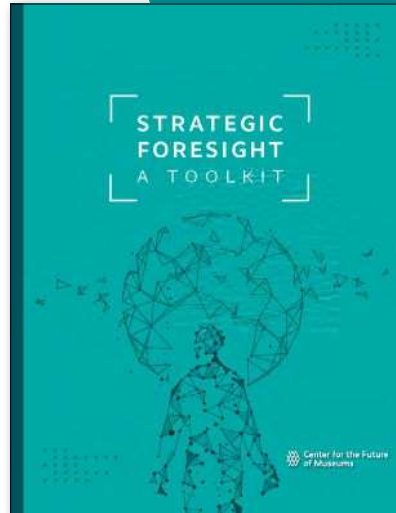
AAM Toolkits



Check out our **Mastering Your Museum's Core Documents Toolkit** for guidance in drafting or revisiting your museum's core documents:

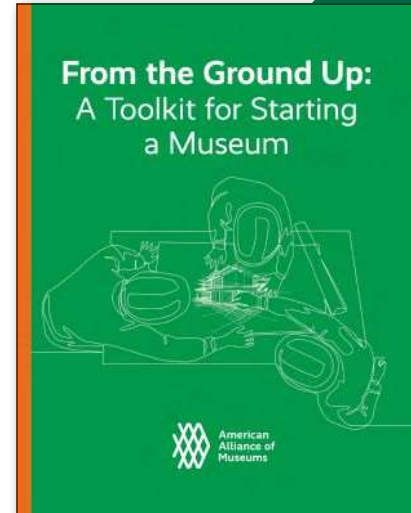
- Mission Statement
- Institutional Code of Ethics
- Strategic Plan
- Disaster Preparedness and Emergency Response Plan
- Collections Management Policy

Retail price: \$74.99
AAM Member Price: \$69.99



If strategic planning season is upon you, the Center for the Future of Museums has you covered with our **Strategic Foresight Toolkit**. Our ever-evolving environment demands plans and strategies that can foresee potential challenges and prepare you to address them head-on. Develop strategic foresight skills that can help guide you in creating a nimble plan ready for anything.

Retail price: \$60
AAM Member Price: \$50



Whether you're learning more about what's involved in starting a museum or helping advise on the creation of one, **From the Ground Up: A Toolkit for Starting a Museum** provides a comprehensive guide to the basics of launching and operating a sustainable museum. Find quizzes, worksheets, templates, sample documents, and more in this robust resource.

Retail price: \$90

Browse all AAM Toolkits, see what's included in each, and purchase your copies today!

Visit  aam-us.org/toolkits





Channel Islands Maritime Museum

In “Resilience: Art of the Channel Islands,” five award-winning local artists—Joe Adams, Holly Woolson, Linda Legman, Genie Thomsen, and Christina Altfield—use unique mediums to explore the flora and fauna of the Channel Islands. Through printmaking, painting, drawing, and ceramics, these artists capture the extraordinary diversity of the many species that call the Channel Islands home.

Location: Oxnard, CA

Dates: through Dec. 15

Learn more: cimmvc.org/71-honoring-vital-waters-copy

Santa Monica History Museum

“Broadway to Freeway: Life and Times of a Vibrant Community” examines how residents that included African American, Mexican American, and immigrant community members built the Broadway neighborhood in Santa Monica into a flourishing community—and how the Interstate 10 freeway destroyed it in the 1960s. Featuring period photographs, ephemera, oral histories, and an original song, the exhibition draws on the wealth of archival material collected by the Quinn Research Center, which is dedicated to preserving the history of African American life in Santa Monica.

Location: Santa Monica, CA

Dates: through Dec. 23

Partner: Quinn Research Center

Learn more: santamonicahistory.org/current-exhibition/

Tucson Museum of Art

“More Than: Expanding Artist Identities from the American West” focuses on works of art created throughout the American West, the US Southwest borderlands, and parts of Canada, viewing how artists embrace parts of themselves and incorporate these identities into their art. This exhibition explores how works of art speak to the ways artists assume multiple roles, serving not only as a creator of artwork, but as community members, storytellers, knowledge bearers, activists, immigrants, and countless positions not always evident.

Location: Tucson, AZ

Dates: through March 19, 2023

Learn more: tucsonmuseumofart.org/exhibition/more-than/

Holly Woolson; courtesy of Quinn Research Center; Bobb Vann, *Ranch Wrangler*, 2010, collection of the Tucson Museum of Art

Filoli

Filoli's renovated vegetable garden is now a place to gather with friends, learn about Bay Area food cultures, and hear from Filoli horticulturalists on how to care for your own garden. View the berry cage, find tips in the demonstration garden, and explore the rainbow of reasons to celebrate the Bay Area's immigrant communities through Filoli's partner plots. The season's harvest is used in products for the Clock Tower Shop, shared in public programs, and donated to local food banks.

Location: Woodside, CA

Learn more: filoli.org/vegetable-garden/



David J. Sencer CDC Museum

"Influenza: Complex Virus/Complex History" traces the global impact of influenza viruses since the 1918 pandemic. Influenza viruses are biologically and historically unique, and small changes in their genes occur frequently. In modern times, recurring influenza outbreaks have prompted virologists, medical professionals, and public health workers to search for ways to prevent influenza transmission and reduce the effects of influenza infections.

Location: Atlanta, GA

Dates: through Dec. 2

Learn more: cdc.gov/museum/exhibits/influenza.html

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Edouard Manet (French, 1832–1883). *The Croquet Party*, 1871. Oil on canvas, 18 x 28 3/4 in. (45.7 x 73 cm). Gift of Henry W. and Marion H. Bloch 2015.13.11.



Taubman Museum of Art

Spanning nearly 500 years, the 52 works comprising “Titian to Monet: European Paintings from Joslyn Art Museum” narrate a broad history of European painting from the Italian Renaissance to 19th-century French Impressionism. The exhibition marks the first time that Joslyn Art Museum in Omaha, Nebraska, has loaned a selection of its European paintings as a traveling exhibition. A new multisensory, immersive audiovisual experience featuring these paintings will come alive in a companion gallery through a partnership with Virginia Tech and Roanoke College.

Location: Roanoke, VA

Dates: through Jan. 8, 2023

Partners: Joslyn Art Museum, Virginia Tech, Roanoke College

Learn more: taubmanmuseum.org/calendar/25419/titian-to-monet-european-paintings-from-joslyn-art-museum

Peabody Essex Museum

“Power and Perspective: Early Photography in China” explores how the camera transformed the way we imagine China. The exhibition features 130 photographs in dialogue with paintings, decorative arts, and prints. The exhibition provides a rich account of the exchanges between photographers, artists, patrons and subjects in treaty port China, offering a vital reassessment of the colonial legacy of the medium. By calling attention to the power dynamics at play, the exhibition sheds light on photography as an inherently social medium that continues to shape our perspectives today.

Location: Salem, MA

Dates: through April 2, 2023

Learn more: pem.org/exhibitions/power-and-perspective-early-photography-in-china

Holocaust Museum Houston

“Charlotte Salomon: Life? Or Theater?” features over 200 small gouaches on paper that Salomon created as part of a larger body of work in the early 1940s when in hiding from Nazi oppressors. These remarkable gouaches unveil a vivid self-portrait spanning all facets of Salomon’s existence: from a complicated family life, growing up in Berlin, the rise of the Nazis, and her exile to France.

Location: Houston, TX

Dates: through Dec. 4

Learn more: hnh.org/exhibitions/charlotte-salomon-life-or-theatre-2022-08-19

Pierre-Auguste Renoir, *Young Girls at the Piano*, 1889, Joslyn Art Museum, photograph © Bruce M. White, 2019; John Thomson, *Curio Shop*, 1868–1872, Peabody Essex Museum; *Self-Portrait*, Charlotte Salomon Collection, Jewish Historical Museum, Amsterdam © Charlotte Salomon Foundation

Halsey Institute of Contemporary Art at CofC

For her exhibition “Only You Can Prevent A Forest,” Kirsten Stolle created photo-based collages, visual poetry interventions, text-based sound animation, a neon wall piece, and her first site-responsive sculptural installation. Building upon her decade-long research into companies like Bayer/Monsanto and Dow Chemical, the work will forefront historical ties to chemical warfare and reveal persistent greenwashing.

Location: Charleston, SC

Dates: through Dec. 10

Learn more: halsey.cofc.edu/main-exhibitions/only-you-can-prevent-a-forest/



The Barnes Foundation

“Modigliani Up Close” explores Amedeo Modigliani’s working methods and materials. Building on research that began in 2017 with a major retrospective at Tate Modern, this focused project takes a close look at how Modigliani created his works. New scholarship by specialists across Europe and the Americas informs a detailed investigation of the artist’s unique style, casting new light on his practice, in an exhibition that brings together important pieces from museum collections.

Location: Philadelphia, PA

Dates: through Jan. 29, 2023

Learn more: barnesfoundation.org/whats-on/exhibitions/modigliani-up-close

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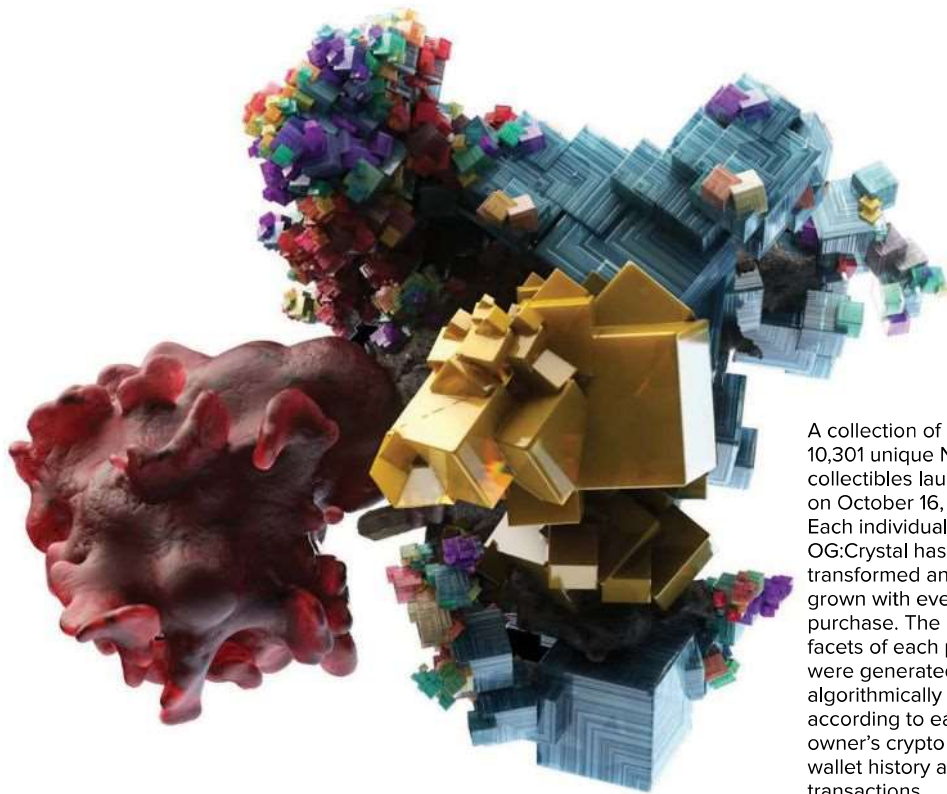
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A New Digital Dimension

The museum field must work together to answer the many questions surrounding NFTs and their implications for museum practice.

By Ulvi Kasimov



A collection of 10,301 unique NFT collectibles launched on October 16, 2021. Each individual OG:Crystal has transformed and grown with every purchase. The facets of each piece were generated algorithmically according to each owner's crypto wallet history and transactions.

Museums select, preserve, and study artifacts of tangible and intangible heritage. They create opportunities and spaces for communication

to help people achieve a more mindful future based on memory, knowledge, and culture. Over the past century, museums have continued to make significant

strides in how to best preserve and present their physical collections. However, today, every museum must also develop reliable policies and systems that support sustainable access to their digital ecosystems and the content within it.

Currently, leading museums worldwide are conducting high-quality digitization, creating digital twins of real objects, storing huge amounts of media files, developing powerful databases, and applying artificial intelligence technologies to collections cataloging and access. All of these digital production efforts help propel new research and popularize museum collections.

Digital programming and engagement are now an inescapable part of our lives, and they need to be an intrinsic part of the museum experience. As museums increase their digital activities (including digitizing collections and acquiring and commissioning born-digital art), they expect a *return* on those activities, such as an increase in website traffic that, in turn, increases membership or on-site visitation. Or they expect direct revenue from pay-to-play offerings

Michael Joo and Danil

such as livestreaming events.

Many museums are also wondering about the opportunities inherent in NFTs, or non-fungible tokens.

What Is an NFT?

An NFT is a digital receipt or certificate of ownership or authenticity of a “digital good.” NFT drops (the public release of an NFT) are the sale of digital representations of works of art. In addition to a digital surrogate of a collection object, an NFT could represent ownership of a born-digital artwork. Soon there will be time-limited NFTs to account for a temporary certificate

of ownership or authority, which museums could use for membership, exhibition admission, or digital subscription.

NFTs are part of the technological evolution of the internet, or Web3. This next stage will be characterized by a decentralized architecture and token-based economies, which define three critical technologies: blockchain, cryptocurrency, and NFTs. Blockchain is a decentralized digital public ledger that records transactions that are duplicated and distributed across a network of computer systems. This system of recording information makes it very difficult or impossible to

change, hack, or cheat without it being tracked. Cryptocurrency, a digital token-based financial system, and NFTs both require the blockchain.

Web 1.0 required museums to publish and engage with audiences through institutional websites, and Web 2.0 required them to deepen engagement through social media platforms. Now museums must begin to consider how to leverage Web3 technologies and paradigms in their business models, operations, and digital strategy.

Assessing the Risk

As museums begin discussing whether to embrace NFTs as

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89 seconds Atomized by Eve Sussman was created in 2019 as 2,304 unique blocks of artwork on the blockchain and can be reassembled and screened at will by the community of collectors.

a revenue opportunity and cryptocurrency as a transaction option, assessing their viability is paramount. These are emerging technologies that represent some risk as the volatility of cryptocurrency has demonstrated. To participate, museums will need legal advice and investment in such things as staff training, secure storage of information related to the crypto wallet, and cyber security and merchant services. Museums wishing to “mint” and “drop” digital surrogates of collection objects will need legal

clarity on collection rights and reproduction.

These legal, technological, and operational issues will require insight and expertise from others involved with Web3 to ensure success. Current platforms on which recent museum drops have been released, such as OpenSea, are generic exchanges where any kind of NFT can be purchased. However, organizations are beginning to offer exchanges specifically for cultural heritage and fine art. Partnering with such groups could allow museums to

enter this market at low risk and with an expert guide.

For museums, the question of whether or not to purchase or sell NFTs or whether or not to use or accept crypto is similar to the late 1990s when the question was whether or not to have a website. These technologies will define future digital engagement and transactions, and mature usage standards will help the museum field create a genuine, transparent, and authentic cultural heritage environment—and potentially sustainable models in a digital world.

Basic NFT Questions Answered

Once the decision is made to pursue NFTs, there are a multitude of considerations. Here are a few frequently asked questions and answers to help inform decision-making.

Can museums monetize NFTs?

Yes. Museums have long sold the rights to use images, for example, in catalogues or as souvenirs. The same applies for digital art and

HOW CAN .ART HELP?

Since its conception in 2015, the team behind .ART Domains has been researching and providing the creative community with digital tools and solutions to bridge the gap between art, technology, and finance.

For example, as discussed in this article, museum ownership of a crypto wallet isn’t necessarily clear. However, .ART offers a solution to this problem: by registering a traditional .ART domain in the DNS, one automatically reserves the same name in the Ethereum Name Service (ENS), a distributed, open, and extensible naming system based on the Ethereum blockchain. The ENS name can then be activated and paired with a crypto wallet, thereby associating it with the museum.

This feature forms part of .ART Digital Twin, available in beta on x.art, an ecosystem that addresses the following concerns of IP rights protection, certification, and monetization of digital art objects.

NFTs, with potentially greater flexibility and profit. Also, if NFTs are resold, the originator will see a percentage of that resale. Tickets to an exhibition could be sold along with NFT souvenirs. Automated control of royalties or exhibition rental based on smart contracts with partners is also feasible. However, the same legalities apply for works under copy-right, and museums will need to work with creators, estates, or other representatives.

Legally, the acquisition of an NFT is not related to the acquisition of an art object and any rights. How does one legally

formalize the transfer (acquisition) of an NFT?

An NFT is a smart contract. Essentially, it is lines of code that assign ownership of the digital good represented. The code also manages the transferability of the NFT. When an NFT is minted, these lines of code are executed and added to the blockchain on which the NFT is being managed. Just as a museum would seek legal advice to draw up a contract, they must do the same here. Once on the blockchain, NFTs are nonrevocable.

What rights and guarantees does a smart contract give you? Does

it leave the author (the previous owner) with the right to transfer the NFT to anyone or destroy it?

These details should be spelled out in the smart contract and can be viewed by auditing its source code. Make sure that the contract, which should be drawn up by professionals who understand these issues, accounts for downstream transactions.

How viable is the blockchain network? What will happen to it in, say, 10 years considering potential economic, energy, and technological crises?

Like any nascent technology, it is hard to predict its future. One can

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mitigate the risks by opting for NFTs based in the most decentralized, popular, and economically capitalized networks, like Ethereum. Because the value of an NFT is based on the market value of the cryptocurrency employed at the time of the transaction, it can fluctuate.

The intense computing power that is needed to mint NFTs is also a concern for museums seeking to meet environmental sustainability goals. However, platforms like Ethereum are pursuing greener computing solutions.

Can we officially own crypto wallets as a museum entity?

A digital wallet is required to buy or sell an NFT. The public is becoming familiar with this concept as they use Apple Pay, Samsung Pay, and Google Pay to store their debit and credit cards and make purchases with their mobile phones. Currently, the owner of the wallet is the person who knows its address and access password, and the verification process depends on each platform. However, the wallet “profile” does

not allow any other personal data. (See “How Can .ART Help?” sidebar on p. 18 for information on how museums can get around this problem.)

We have received an NFT in our crypto wallet. How do we keep it safe now, and how do we ensure safety and readability in 10, 100, or 1,000 years?

There is no clear-cut answer to this question yet, but museums can use protocols similar to those used when they receive donations of stocks or bonds. Most museums will liquidate the asset as soon as possible, or in this case, exchange cryptocurrency for traditional currency.

Wait, There’s More

Increasingly, museums need a formal digital strategy to determine how they will embrace digital platforms and ecosystems in competitive and sustainable ways. Museums also need a reliable technology infrastructure as more critical information, business transactions, legal documents, and cultural heritage become digital and, specifically, born-digital collections. Museums renewing their insurance are likely seeing significant increases in cybersecurity premiums as insurers recognize the increased reliance on technology to support museum business.

With NFTs and cryptocurrency, there are currently more questions than the expertise, legislation, and analytical environments needed to answer them. The museum community is both intrigued by

the possibilities and intimidated by the profound challenges surrounding digital art and NFTs. These questions, although seemingly overwhelming, are just the tip of the iceberg.

Other things to consider include the storage of the original NFT media file(s), which includes hosting, contracts, agreement parties, metadata payment periods and expiration, and access regulation and whether a museum needs its own digital, 3-D, or metaverse space to display NFTs. What about NFTs that are based on artworks that have an element of artificial intelligence, especially dynamic ones that change over time? And what about NFTs that are based on real digitized objects and not original digital art or material?

The museum field needs a community of like-minded innovators and visionaries to propel discussion of such questions, embark on research, and otherwise navigate this digital dimension. We must create more opportunities for dialogue between museum leaders and practitioners, technology experts, and artistic representatives to better understand the potential and nuances of NFTs.

Ulvi Kasimov is founder of .ART, the art world’s digital domain where artists, institutions, and creatives from all walks of life can register a clear and concise website address. Observer named him one of its Arts Power 50 in 2020.

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Making It Visible

An oral history project shines a light on the invisible history of museum computing.

By Paul Marty and Kathy Jones



“I was a maritime archaeologist...and I was working at the West Australian Maritime Museum....I had an extremely clever boss...very clever man, and he said to me, I think it was 1993, and he said, ‘Sarah, there is something called the World Wide Web, and I want one.’” —Sarah Kenderdine, Professor of Experimental Museology, École Polytechnique Fédérale de Lausanne

In 2020, we embarked on a project to chronicle the history of the invisible work of museum computing by collecting oral histories from a wide range of museum technology professionals. We were inspired to tackle this project because we wanted to preserve stories that could help put a human face on the history of museum computing.

When it comes to museum technology projects, too many people only see the finished product and miss the extensive work that takes place behind the scenes. We hoped that these stories would provide useful insights into the wide-ranging responsibilities and all-too-often unseen activities of museum technology workers.

We reached out to current and former museum technology professionals, asking if they would be willing to share stories from their own personal experiences in museum computing. We collected over 40 hours of oral histories comprising nearly 400,000 words of transcribed text from more than 50 museum technology professionals working in the Americas, Europe, Asia, and Australia from the 1960s to the present day. We recorded these oral histories in 2021, and after transcribing, editing, and organizing, this collection of oral histories is now available online. (See Resource box on p. 26 for the website.)

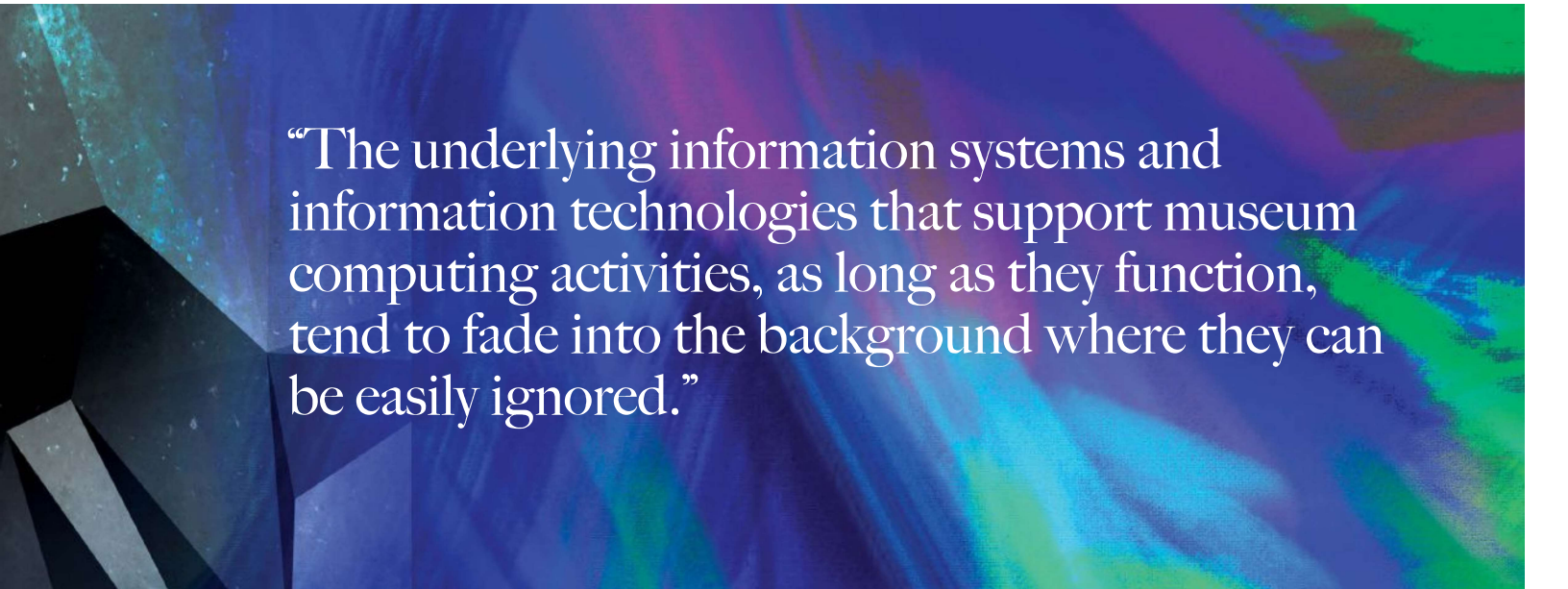
These oral histories vividly document how the challenges and opportunities facing museum technology professionals have evolved and recurred over the decades. They highlight their amazing

behind-the-scenes work in support of metadata initiatives, collections management, interactive exhibits, online experiences, and other digital museum projects. Here we present an overview of several themes that emerged from these oral histories. Each theme is illustrated with quotes from the participants, which have been lightly edited for clarity. Their titles and organizations correspond to when they submitted their oral history and may be different today.

Inherent Invisibility

One of the challenges that museum technology professionals face stems directly from the inherent invisibility of information infrastructures. The underlying information systems and information technologies that support museum computing activities, as long as they function, tend to fade into the background where they can be easily ignored.

So long as those systems aren't visibly breaking or causing trouble in some way, they can be pretty invisible. I mean in a good sense and a bad sense, they're a little bit like plumbing. If they're working it's great; if they're not, you really know it; but you often don't think about whatever sorts of ongoing maintenance and proactive engagement they require that takes very specific kinds of knowledge. —Rob Lancefield, Head of IT, Yale Center for British Art



“The underlying information systems and information technologies that support museum computing activities, as long as they function, tend to fade into the background where they can be easily ignored.”

This kind of invisibility can be a double-edged sword for museum technology professionals. Invisibility offers a certain amount of autonomy but also the potential for misunderstanding the technology professional's actual job. When all people see is the end product of technology work, it's easy to miss the effort involved in the process of creating the product.

With the IT teams here, everything is below the waterline. Everything that you see as a visitor—almost all the work that happens to make that seem seamless—is invisible....You have to tell people about the work you're doing. You can't just show what got done. You have to show how it got done, and what it achieved, because otherwise, people don't realize how much work it actually was to get to where we've got to. —Seb Chan, Chief Experience Officer, Australian Centre for the Moving Image

The inherent invisibility of information technology work also poses risks to museums in terms of institutional memory and organizational knowledge. When museum leaders don't understand the work involved in a project or initiative, it can be tempting to outsource it. The more technology work is outsourced—the more museums focus on the product instead of the process—the more likely institutions are to lose key expertise. Keeping technology knowledge in-house is especially important given the increasing demands placed on museum technology professionals over time.

Getting Creative

As museum computing evolved from connecting networked systems to providing access to collections content to offering new forms of audience engagement, museums started to recognize the potential of information technologies, and museum technology professionals began exploring new opportunities. Changing ideas about data access, for example, went hand in hand with the growing realization that the museum's records might actually be useful to people outside the institution.


There was all kinds of data all over the place....And we were trying to figure out how to get things out of the data. Because we were starting to get demands and requests to use this data in other ways. That was when for the first time we thought, "Oh, this isn't just like a fancy card catalog; this data may have usability beyond just this system. And others, other than just registrars, may want to use it."

—Koven Smith, Senior Director/Arts, John S. and James L. Knight Foundation

Considering the massive amount of information available online today, it is astonishing how much changed so quickly. In a few decades, the museum community went from barely thinking about computers to creating massive open-access projects, with millions of records and images available for public use from museums around the world. Changing philosophies about information access brought new opportunities for people to interact with museum data in creative ways.

With "Send Me SFMOMA" you sent the museum a text that started with "Send me..." and you filled in the blank with a word and, in return, SFMOMA sent you an image of an artwork that responded to that word....That was such an unexpected and super beautiful payoff...finding a fresh, new way of making art accessible in a way we hadn't even seen coming through texts and sending images. It was just really a delightful project. —Layna White, Head of Collections Information and Access and Director of Collections, San Francisco Museum of Modern Art

When we examine the growth of museum computing through the lens of these oral histories, we see how many of those advances were a direct result of the enthusiasm of the museum technology professionals who led the way. A sense of delight pervades these stories, with many participants stressing the excitement of using technology to convey ideas and engage audiences in ways never before possible.



“Meeting the increasing demands of museum computing required technology professionals to develop strategies for overcoming resistance to change. They often looked to create institutional support by identifying innovation champions and professional networks.”

We did a lot of interactives at San Diego.... We did a beautiful one with dragon robes that was actually a Chinese cabinet where you could virtually pull the drawers out and look at pieces....It was just a really wonderful time....We really had the time to think through projects and go as wonderfully deep as we wanted to in discovering kingfisher feathers in Chinese jewelry.
—Holly Witchey, Director of Education and Outreach, Intermuseum Conservation Association

This freedom to experiment with new technologies and try new things was a pervasive theme for many early computing pioneers. The mid-1990s was a particularly exciting time as museums pushed forward with new online technologies, often with the support of visionary directors. They were not bound by legacy systems or the mindset of doing things as they had always been done. This relatively risky behavior continued into the early 2000s, and in some cases today with newer technologies like chatbots, artificial intelligence, and virtual reality.

I can remember this slightly harrowing moment when I realized that I'd advertised a family workshop around augmented reality, and I literally didn't know what I was going to do.... I had maybe two weeks, and I remember sitting, kind of slightly panicked, in my bedroom in my tiny apartment in London, being like, “Okay, I really got to get it together now. I have to research AR and figure out how, in two weeks' time, I'm going to design some sort of digital learning experience for these families that are going to come in and have the expectation of doing AR at the British Museum.” —Shelley Mannion, Chief Product Officer, Verisart

RESOURCES

For more information, and to access the oral histories, go to ohmc.cci.fsu.edu/.

For the Public Good

Meeting the increasing demands of museum computing required technology professionals to develop strategies for overcoming resistance to change. They often looked to create institutional support by identifying innovation champions and professional networks. There was also a growing recognition, especially among public institutions, that museums had an ethical obligation to provide greater access to their collections online.

I think there was a lot of resistance and a lot of fear... “What about copyright? And we’ll lose control.” But if the museum’s collections are held in trust for the public, isn’t it our mission to make that information accessible to the public? I would argue, it is. It’s their collection, we hold it in trust for them, so we should make high-resolution images available when we can. —Kate Collen, Johns Hopkins Museum Studies Faculty and Museum Consultant


With that recognition came new methods for meeting information needs, and new ideas about the museum’s role when interacting with visitors. The more museum professionals learned about how their visitors used information resources online, the more their focus shifted from thinking about the visitor in the life of the museum to the museum in the life of the visitor.

We brought our website into the usability lab to do some testing, and this was revolutionary for us... We brought teachers from all over the state and gave them scenarios that we wanted them to work through.... And our developers almost went home crying every day—they kept yelling, “Just click this! Click that!”—they were realizing people weren’t seeing anything that they had anticipated people would see in the

user interface. But that was huge for all of us. It really brought us back home to think about our end users, how critical it was for us to better understand our end users, what they were looking for, and how our interfaces work for them. —Scott Sayre, Chief Digital, Information, and Education Officer, Corning Museum of Glass

This shift in focus brought a new mindset for museum professionals, as more institutions recognized the potential of technology to support the museum’s mission and the importance of building new cultures of empathy, evaluation, and understanding. Museum professionals realized that new technologies could help their visitors, online or in person, use their resources to make a difference in their everyday lives, no matter where they lived in the world.

Museums are at a pivotal moment when technology and digital initiatives are more important than ever. We hope that the oral histories we have collected will shine a powerful light on museum computing professionals’ behind-the-scenes work—and help museum leaders, and the field at large, prioritize their work going forward.

 **Paul Marty** is a Professor in the School of Information in the College of Communication and Information at Florida State University. **Kathy Jones** is Director of the Museum Studies Program at Harvard University Extension School.




Expanding Public Value

As you build bridges with communities, consider using digital tools.

By Deborah Howes

In the reading room of Brooklyn Public Library's Center for Brooklyn History, teachers learned from oral historian Zaheer Ali about a new digital resource—muslims.brooklynhistory.org—and provided feedback that was integrated into the final site.







Teacher Jenelle Diljohn prompts a first-grader from Seaton Elementary in Washington, DC, to describe what he sees in Wassily Kandinsky's *Improvisation 31 (Sea Battle)*, which the National Gallery of Art captures on video for its edX online course platform.

In the 2022 AAM *TrendsWatch*, author Elizabeth Merritt proposes a new way of thinking about our institutional value not as museums, per se, but as “big bundles of assets that make their communities better, stronger, and more resilient.” I wholeheartedly agree with this entire must-read report, but I also expect this change in mindset will be difficult for most museums to plan for, let alone carry out.

Tying institutional value to the strength and quality of our collections, history, staff, and buildings is the primal instinct of most museums; the needs of our communities are often, regrettably, a secondary concern. As a concrete step to changing this ethos, consider focusing first on your digital offerings—web-site, social media presence, digital learning programs,

online resources, and virtual events. Experimenting with digital tools and platforms can be a more efficient and effective way to connect with communities than changing on-the-ground operations, as long as your digital support team is engaged from the first brainstorm forward.

Let's look at some ways in which four key visitor categories—older adults, independent learners, K–16 classrooms, and people seeking community connections—rely on digital resources to fulfill critical needs and how some cultural organizations are responding.

Older Adults Are Game

If adults over the age of 55 do not already represent the largest percentage of your museum's visitorship, they might soon. The US Census Bureau recently reported that in a few years, for the first time in history, Americans age 65 and older will outnumber those under 18.

That demographic fact inspired a special edition of the Culture Track 2021 report *Untapped Opportunity: Older Americans & the Arts*. Drawing from the survey responses of over 28,000 older adults (those 55 and older), the report challenged common biases about this group's ability and interest to learn via digital means. Not only did a very high percentage of older adults participate online (even 52 percent of the 85 and above age group!), but they also report getting more out of these encounters than other age groups. In addition to appreciating the exposure to new ideas, they find learning online fun and relaxing.

This is not news to Carolyn Halpin-Healy, the Executive Director of Arts & Minds (A&M), which offers museum-based experiences for people with dementia and their caregivers. When A&M staff moved its place-based programs to a video-conference platform in April 2020, most participants were eager and able to meet online. Some participants with dementia were able to navigate the technology themselves, while others had the support of a care partner.

RESOURCES

2022 *TrendsWatch: Museums as Community Infrastructure*

aam-us.org/programs/center-for-the-future-of-museums/trendswatch-museums-as-community-infrastructure-2022

Culture + Community in a Time of Transformation: A Special Edition of Culture Track, 2021

culturetrack.com/research/transformation/

Untapped Opportunity: Older Americans & the Arts, 2022

bit.ly/3zXj4pM

National Gallery of Art teacher resources
nga.gov/learn/teachers.html

Molly Brown House Museum school programs
mollybrown.org/learn/sc

ADVICE FOR MOVING FORWARD

Determine if supporting health professionals and dementia patients would be a good “community” fit. If so, consider the Engaging Arts & Minds online course (beginning 2023) at artsandminds.org.

Integrate your museum into the Wikimedia universe. This blog post by Synatra Smith tells you how: bit.ly/3T1y9PM. Test your success by asking your smart speaker leading questions about your museum.

Ask your local schools what teachers need regarding online resources and virtual programs. Would transforming your on-site professional development programs into online opportunities make them more accessible? Are there regional and national educational associations or peer institutions that might collaborate on content development or provide visibility?

Review how your museum’s changes in practices related to diversity, equity, accessibility, and inclusion are reflected in your online presence. Do your blog posts illuminate new perspectives? If so, promote them to online communities that might appreciate and amplify your efforts.

“Those who were no longer able to physically join us inside museums were actively engaging online,” Halpin-Healy says. “Relatives who lived far away could now connect with loved ones, and artists welcomed participants into their studios via virtual group visits.”

Halpin-Healy believes that every museum can create community-based programs for people with dementia and their caregivers, and the Mellon Foundation agrees. Together they are creating an online professional development opportunity for museum educators and teaching artists who want to start similar programs for older adults in their communities. Beginning in spring 2023, this all-virtual program will include live sessions, recorded content, group activities, mentoring, and hands-on exercises in six-week cycles.

Go Where Independent Learners Connect

Wikipedia is the world’s largest, most comprehensive encyclopedia, attracting millions of users with authoritative articles in 60 different languages. Publishing well-written text supported by images, videos, and links to web pages to Wikipedia is an effective way to attract independent learners to your museum’s website and can connect your institution’s research, collections, and exhibitions with communities of mutual interest.

Dr. Synatra Smith, the CLIR/DLF Postdoctoral Fellow in Data Curation for African American Studies

at the Philadelphia Museum of Art, uses Wikipedia as a primary means of communicating publicly about changes in the museum’s collection and documentation practices related to local Black cultural landscapes and related topics. Philadelphia was and is home to generations of Black artists whose work and histories are largely unrecognized by most cultural institutions. Using her expert knowledge of Wikidata—the underlying structure supporting Wikipedia searches—Smith shares the museum’s research on the history of local African American artistic production to broaden the public’s understanding of American art history. Not only will interested individuals easily find these materials but so will the artificial intelligence systems that use Wikipedia to power smart audio speakers and online search engines, for example.

To knit your institution’s content closer to the Wikipedia brain stem, start with a topic that is central to your mission, connected to a community of interest, and present in Wikipedia. Would adding or linking content from your website help visualize or deepen the discussion of this topic in a productive way? If so, secure a Wikimedia-approved institutional editor status (a quick step for accredited museums). This is also a good time to enhance your museum’s Wikipedia entry (in as many languages as possible) and to review your institution’s Wikidata information. Understanding and leveraging the Wikimedia Universe (which now also powers Wiktionary,

Wikibooks, Wikisource, Wikiquote, and Wikinews) is an inexpensive and expedient way museums can reach inquiring minds searching online.

Hybrid Needs for K–16 Classrooms

In mid-2020 the National Gallery of Art in Washington, DC, began offering free, live webinars and online resources to teachers all over the world now working remotely. Julie Carmean, Manager of National Teacher Programs, invited museum educators and classroom teachers to demonstrate how critical thinking pedagogies, images of artworks—many created by artists of color—and strategies supporting social-emotional goals can be integrated into lessons delivered over a basic web conference platform. An overwhelmingly positive response inspired the National Gallery to balance accessible online learning opportunities with the excitement of in-gallery engagement for teacher professional development.

Before creating these programs and resources, however, learn how classroom teaching has changed. “Well-produced audio and video materials are very welcome for most educational purposes, but shorter is better in today’s busy classroom,” says Alex Tronolone, a former classroom teacher who now manages K–16 curriculum at the New York Public Library’s Center for Educators and Schools.

Tronolone led the development of an award-winning web resource for The Center for Brooklyn

History at Brooklyn Public Library called “Muslims in Brooklyn.” The teachers he consulted encouraged him to edit the two dozen, two-hour-long oral histories documenting Muslim life in Brooklyn into five- to eight-minute excerpts so they could fit within a single lesson.

Schools largely stopped museum field trips during 2020–21, and now many seek “hybrid” solutions that combine online, off-site, live, and/or self-paced learning components. Museums like the Historic Denver Molly Brown House are adapting accordingly. “The pandemic made us realize that virtual tour programming better serves schools located far away and also creates more equitable experiences for students with physical disabilities,” says Heather Pressman, Director of Learning and Engagement. Equipped with only a tablet, tripod, and a wireless microphone, education staff provide dynamic virtual programs directly from every floor of the historic house.

Unlike Pressman—a seasoned virtual learner and educator—most museum professionals require help transforming on-ground practices into successful hybrid experiences. Understanding when and how to organize learning opportunities for online use before and after a live event is a new challenge for museum staff. Recognizing this statewide need, the Texas Association of Museums (TAM) created an interactive, hybrid professional development program featuring live webinars with museum practitioners, demonstration videos, and hands-on learning challenges. Spring 2022 graduates became TAM Fellows who now serve as regional mentors to help other cultural institutions create new virtual programs.

Building Trust with Communities

Current events have inspired urgent public discussions about diversity, equity, and inclusion in museum work. Growing numbers of cultural organizations have updated labels, disassembled exhibitions, and reevaluated collections and programming in response. The 2021 *Culture + Community in a Time of Transformation* report by Culture Track confirms that learning about systemic racial injustices, income inequality, and other social issues are top priorities for culture-seeking audiences.

At the Gilcrease Museum in Tulsa, Oklahoma,



The recording of a middle school math class visit to the National Gallery of Art’s Sculpture Garden to discuss math concepts through looking at art will be used in the museum’s second online professional development course for teachers.

Artwork credit: Roy Lichtenstein, *House I*, model 1996, fabricated 1998, National Gallery of Art Washington © Estate of Roy Lichtenstein; photo credit: National Gallery of Art



Growing numbers of students and teachers in the New York City Public Schools belong to Muslim communities. The website “Muslims in Brooklyn” offers primary sources that support the teaching of multiple historical viewpoints.

Director of Digital Collections Diana Folsom (Choctaw) is working with local advisors with expertise in Native American histories and culture to remotely explore the museum’s collection and suggest alternative or additional information reflecting Indigenous vocabularies and practices. Similarly, the museum employed an advisory group of specialists in the local African American experience when in 2020 the museum received more than 100 oral histories documenting the lives of survivors of the 1921 Tulsa Race Riot—all recorded by schoolteacher Edie Faye Gates. When the museum reopens with a new facility, these critical collection augmentations will power new paths for exploration and convergence for physical as well as virtual visitors.

“Inviting and engaging communities to collaborate on core museum services like the documentation of collection materials requires time, patience, and compensation for work delivered,” Folsom advises. These critical investments are fundamental to building trust among community members as museums grapple with responding productively to the realization that

our museums have prioritized Western-dominant knowledge. We must invite, include, debate, and otherwise engage with a full range of viewpoints in order to be relevant to current and future generations of visitors.

Having stuff is no longer enough to speak with an authoritative voice; simply opening buildings will not make people come. Begin this hard work of community trust building by inviting a few members to an informal meeting (on-site or virtual). Be prepared to mostly listen and take good notes.

As President of Howes Studio, **Deborah Howes** partners with cultural organizations (many of whom are featured in this article) seeking to innovate digital processes, programs, and content intended for online engagement. She shares her passion for the future of museum education with the Museum Computer Network (MCN) community as well as emerging professionals in the US and abroad.



MIND THE GAP

By Haitham Eid

The pandemic shone a bright light on the digital divide among museums, but with collective action digital equity is possible.

Museums, like many other

organizations across the nonprofit and for-profit sectors, have recently accelerated their digital adoption to cope with the impact of the pandemic and other societal changes. But while some museums have been able to explore innovative ways to serve their communities and achieve their missions, others have not, exposing an alarming digital inequity among museums.

The National Digital Inclusion Alliance defines digital equity as “equal access and opportunity to digital tools, resources, and services to increase digital knowledge, awareness, and skills.” Digital transformation requires resources, skills, and processes that may not be readily available to the small and medium-sized museums that represent the backbone of the museum sector.

Meanwhile, larger museums often struggle with questions about institutional voice and presence in the digital space, who produces digital content, how digital is being managed, and which digital content is being prioritized and publicized. These are legitimate concerns for museums striving to become more diverse and inclusive spaces and to manifest their role as agents for social change.

Within this context, One by One, an international consortium of research institutions and museum professional bodies and practice communities, is investigating digital equity in museums. Through the project, which is supported by the National Endowment for the Humanities, six diverse museum scholars are leading six strands of action research, which will be published in an open-access book by the end of 2023. Following is an early overview of the One by One team’s research projects, which highlight existing challenges and potential solutions to digital inequity in the museum sector.

Funding and Resources

Culturally specific, rural, and small museums in the US continue to face systematic funding inequity that challenges their ability to develop their digital capacity, skills, and literacy. This funding inequity also restrains their ability to grow, scale projects, develop employees’ skills, respond effectively to unexpected digital changes, and meet the digital needs and interests of their communities. Research by Helicon Collaborative shows that 2 percent of all US cultural institutions receive nearly

60 percent of all contributed revenue. The 2 percent consists of 925 cultural organizations that have annual budgets of more than \$5 million.

Through the HueArt NYC project website, Stephanie Cunningham, One by One Scholar and Founder of Museum Hue, highlights the inequity in funding arts organization created by Black, Indigenous, Asian, Latinx, Pacific Islander, Middle Eastern, and all people of color (POC) in New York. In 2021, the project identified 433 arts entities in New York City founded and led by POC. These organizations are spotlighted on a digital map and directory on the project website to promote greater visibility, self-determination, and support. In addition, a community-informed brown paper on the website offers recommendations for ensuring the long-term stability and sustainability of these arts entities.

Overcoming the Digital Divide

The US faces a worrying digital divide, which refers to the gap between those who have access to computers and the internet and those who have limited or no access. POC are most disproportionately impacted by the digital divide due to economic inequality and lack of digital infrastructure. According to Catherine Devine, One by One Board Advisor and Director of Microsoft Tech for Social Impact, Business Strategy—Libraries and Museums, unreliable internet access can take the form of data caps, in which service is limited (similar to many phone plans); low bandwidth, which doesn’t accommodate up-to-date content or formats; or simply no access at all, as in many rural communities in the US and in countries around the world.

During the pandemic, the world used the virtual sphere to avoid physical interactions. This meant that people were using computers and bandwidth to work, study, shop, and find entertainment. Low-income households, however, often didn’t have enough computers or adequate internet speed to meet their family’s needs. I received many messages from students asking me to extend assignment deadlines because they had to share computers with family members. This lack of computer and internet access is a problem for museums that aspire to serve communities of color with digital content.

The digital divide also exists among museums,

where small, rural, and culturally specific museums are disproportionately impacted. During the pandemic, larger well-resourced museums were able to call on or develop their digital skills, literacy, and hardware to provide content and programming for their audiences. On the other hand, many small, rural, and culturally specific museums did not have the funding or infrastructure to do the same. The digital divide among museums and under-represented communities underscores the significance of race in digital inequity.

So, what can museums do to help overcome the unjust impact of the digital divide? Small, rural, and culturally specific museums can collaborate with other community organizations, such as universities, libraries, public TV and radio stations, schools, and other nonprofits, to complement their digital capabilities.

Asali DeVan Ecclesiastes, One by One Scholar and Chief Equity Officer at Ashé Cultural Arts Center in New Orleans, is investigating the capacity of Ashé's peer organizations to respond to the many shared obstacles brought about by the pandemic. Ecclesiastes learned that many of the organizations in her network were not only unable to shift their

programming and projects online, but were also unable to access pandemic relief funding for small businesses. And most did not have relationships with philanthropy that would support and guide them through this collective crisis.

This led to the formation of the Alliance for Cultural Equity (ACE), a collaborative of 18 small, community-based museums and archive organizations, to investigate the ways in which chronic funding disparities, along with the direction of municipal resources into tourist-driven experiences over resident-supporting ones, are endangering the traditional cultural practices of New Orleans. In addition to addressing digital inequity, ACE is also creating strategies for collective advocacy, fundraising, and capacity building. Ecclesiastes' analysis for One by One will explore how bridging the digital divide can provide pathways to close the ever-deepening economic and social inequity between white- and POC-led museums and archive institutions.

As trusted institutions, museums can (and should) bring awareness to the issues of digital equity both within the museum sector and among their communities through exhibitions, public programming, and education. For example, in Barcelona, Spain, urban innovation nonprofit BIT Habitat asked Domestic Data Streamers to create an exhibition to highlight the problem of technological inequity in 2020. The group created the Analog Museum of Digital Inequality, a collection of reinterpreted classical art pieces, such as the *Rosetta Stone 2.0* that pointed out how tech language inhibits technology use by older people and the *Map of Inequality* that showed uneven internet access across the world.

Diversity and Inclusion

The 2018 diversity survey by the Mellon Foundation and the Association of Art Museum Directors revealed that only 20 percent of intellectual leadership positions in US art museums are occupied by POC. The lack of diverse voices in museum digital operations can impact museums' ability to produce digital content that takes into consideration diverse experiences and perspectives. This leads to lack of engagement among segments of the community and potential alienation if content is inadvertently insensitive or offensive. Such

RESOURCES

National Digital Inclusion Alliance
digitalinclusion.org/

One by One
one-by-one.uk

Not Just Money: Equity Issues in Cultural Philanthropy, July 2017
heliconcollab.net/wp-content/uploads/2017/08/NotJustMoney_Full_Report_July2017.pdf

HueArts NYC
hueartsnyc.org

Alliance for Cultural Equity
ashenola.org/alliance-cultural-equity

Virtual Tour: Juneteenth Champions, historic portraits by Ted Ellis
rosenberg-library-museum.org/exhibits/juneteenth-champions-historical-portraits-by-ted-ellis

The Smith Center's Community Curation Program
nmaahc.si.edu/explore/initiatives/family-history-center/community-curation-program

was the case when the civil unrest erupted after the murder of George Floyd in 2020 and many museums were criticized for their social media posts.

The research conducted by One by One Scholar and Director of the Arab American National Museum Diana Abouali investigates the organizational complexity of producing institutional social media content. Specifically, her research found that responding to real-time social justice events on social media can be problematic for some museums as they seek to maintain neutrality and avoid alienating some of their audiences and funders. Others believe neutrality can inhibit museums from becoming agents for social change. Abouali's museum has taken a clear position on supporting Black Lives Matter and other social justice movements. She contends that culturally specific museums have often provided unwavering support for social justice causes partially because they are led by diverse museum professionals who recognize their role as agents for social change.

Other One by One scholars—Ted Ellis, renowned Black artist and Director of the Southern University at New Orleans Museum of Art (SUNOMA), and Doretha Williams, Director of the Robert F. Smith Center for the Digitization and Curation of African American History at the National Museum of African American History and Culture—are also conducting research on digital equity issues. Ellis uses five exhibitions of his artwork at five different institutions to investigate the engagement of diverse audiences with social justice causes in digital and nondigital formats. He has observed that the effective utilization of digital in the museum context can amplify marginalized voices, disseminate facts and reliable information, cultivate community responses, share lived experiences, and encourage collective actions across diverse groups of people.

Williams chronicles the revisioning of the Smith Center's Community Curation project to provide more equitable services for Black communities and institutions in need of digital preservation and collections accessibility. While on the road partnering with institutions, Williams' team recognized the dire lack of up-to-date equipment and affordable, accessible, and secure digital storage. Since the team cannot physically visit each community in need of preservation and digitization services, the Smith Center will supply selected partners with digitization equipment; purchase digital cloud storage to process, store, and securely deliver digitized assets for project partners; and provide specialized training to help partners increase their digital skills and literacy. This work helps bridge the digital divide among museums and cultural organizations while preserving the cultures and histories of underserved communities. (For more on this work, see the "Enriching Connections" article in the May/June 2022 issue of *Museum*.)

It is time for the museum sector to prioritize digital equity as an essential element of digital transformation. In addition to collaborations and advocacy, providing more financial support to museums that have been historically deprived of their fair share of public and philanthropic funding is essential for building digital capacity, skills, and literacy. This work can't be effectively advanced without a diverse museum technology community that represents diverse backgrounds, thoughts, and experiences.

Haitham Eid, Ph.D., is a Professor and Director of the Master of Arts in the Museum Studies Program at the Southern University at New Orleans Museum of Art in Louisiana. He is also the Director of One by One in the US.

ACKNOWLEDGEMENTS

The One by One consortium recognizes the leadership of Professor Ross Parry at the University of Leicester (UK) and all partner institutions, including Southern University at New Orleans (US), American Alliance of Museums (US), Museums Association (UK), the Smithsonian Institution (US), Harvard University (US), Johns Hopkins University (US), and many other museums in the US and the UK.



Rich in detail and passive in interaction design, the “Witness Blanket” by master carver Carey Newman contains found objects from the sites of former Canadian Residential Schools.

Our Opportunity for Change

Using media and technology in exhibition design leads to wider and deeper audience engagement.

By Corey Timpson



The global coronavirus pandemic has been a disruption like none other. Initially, it spared no sector of the global economy, and museums were hit hard. However, our digital infrastructure and information communication technologies were a saving grace that allowed people to remain connected, share, socialize, and conduct some manner of business.

A forest burned down creates fertile soil for regrowth, and out of any disruption comes great

opportunity for change. It is up to us, as museum professionals, geeks, and fans, to take advantage of this opportunity and not regress to the way things were.

When museums closed in 2020, they scrambled to offer remote programming. Out of necessity, both museum professionals and audiences ended up increasing their digital literacy. Meanwhile, it became clear that organizations with more mature and dynamic digital infrastructures and teams were better able to pivot. Both of these facts reveal some of the opportunity

that now exists for museums to provide exhibitions and programming that use media and technology to engage more people in more ways.

Beyond Just the Physical

My approach to exhibition design and development has always privileged a blended experience that considers how to engage both on-site and remote audiences concurrently and how to facilitate discourse between and among audience types. I honed my approach during my tenure at the Canadian Museum for Human Rights (CMHR), where I considered it a necessity.

The CMHR, a national museum located in a remote city with a population under 800,000, deals with an international subject matter. It seemed to me that exhibitions needed to do more than just rely on physical visitation to engage in national and international discourse. I laid out the following prerequisites for my teams and collaborators:

- Ensure that the design is inclusive, which considers all vectors of human difference at the outset versus designing something and then determining how to make it accessible.
- Provide a number of entry points to content and experience through mixed and transmedia, congruent yet stylistic differences (photographic, illustrative, realistic, metaphoric, etc.), and mixed interaction design scenarios (passive, active, interactive).
- Offer both in situ and remote participation to not only engage larger audiences but for prolonged visitor engagement as well.

Notably, these prerequisites work well in concert with one another. For example, ensuring exhibitions welcome and engage the widest possible audiences irrespective of ability-disability means audience members who might never make it to the museum can also participate.

Additionally, these prerequisites were designed to yield strategic returns across the museum's performance metrics: greater audience reach, prolonged audience engagement, increased diversity of audience demographics, greater visitation, greater

active participation and collaboration, greater earned revenue, and more informed programming through a greater plurality of perspectives. This approach proved more successful than originally anticipated. For example, an exhibition with no promotion budget garnered \$8 million in earned media and an exhibition's video game activity saw more activity online than from visitors at the museum.

Blended Design in Action

The following examples of blended design highlight the various ways I used media and technology to satisfy my prerequisites and realize greater strategic returns. These opportunities persist today, and given the advancement in digital literacy and the downside of not approaching program design in this manner, I hope this blended experience approach will become more the norm than the exception across the sector.

The 'Witness Blanket' Exhibition

The "Witness Blanket" is a mixed-media installation created by master carver Carey Newman. It is an assemblage of found objects from the sites of Canadian Residential Schools installed and integrated into a large series of panels. These boarding schools, administered by Christian churches and funded by the Canadian government, were used to assimilate Indigenous children and are now rightfully acknowledged as a part of the colonial genocide

Adding the digital Reflection Wall to the installation facilitated an interactive experience where visitors could express their reflection about the "Witness Blanket" while remote audiences could participate via a web interface.





Protest posters created in gallery or online are projected onto three of the blank signs included in the aggregation of protest signs installed in the “Mandela: Struggle for Freedom” exhibition.

of Canada’s Indigenous peoples. It is an incredibly moving installation.

I wanted to take the passive experience and make it interactive while also enabling remote audiences to explore the blanket and participate. The solution involved creating a digital interface (similar to a simple web page form) that visitors in the gallery could access via iPads and online visitors could access via their web browser. The interface accompanied a high-resolution image of the blanket and detailed visual descriptions.

Once visitors explored the blanket, they could express a reflection (such as “reconciliation,” “peace,” or “genocide”) via the digital interfaces. Their reflections were aggregated and projected across the blanket in the gallery and on an accompanying web page. The more often a sentiment was expressed, the larger it appeared in the collage of words. This intervention blended the experience, making it passive and interactive, analog and digital, remote and in situ. Had the museum closed during the run of this exhibition, the dialogue on colonization and Indigenous genocide that the exhibition was facilitating would have persisted.

‘Mandela: Struggle for Freedom’ Exhibition

“Mandela: Struggle for Freedom” looks at Nelson Mandela and the movement that formed around him in South Africa, following his journey into hiding after he was declared an outlaw, his 27-year-long

prison life, and his role in the country post-release.

This exhibition demonstrates that any one individual can make a difference. Visitors learn about Apartheid and the global movement to end it, the approach and outcomes of South Africa’s first democratic elections, and Mandela’s efforts to rebuild a nation shattered by racism and injustice.

The design of the Soweto uprising portion of the exhibition forces the visitor into a narrow space with the silhouettes of the people protesting on one side and silhouettes of the militarized police force on the other. Visitors can handle replica garbage can lids on the protestors’ side, while a full-scale Casspir tank section sits on the other side. Both sides of the installation were created to emphasize scale and space with multimodal (visual, audio, and tactile) accessibility affordances.

At the Posters for Freedom installation at the end of this section of the exhibition, visitors can create their own protest posters, like those from the uprising. Their posters are then projected onto one of three blank protest signs set in a collection of signs re-created for the exhibition. Remote participants can develop their own posters at PosterForFreedom.ca and have them projected in the gallery. All posters, whether created in the gallery or online, are available at this website. Even when the exhibition is between venues, educators can have their students create protest

TIPS ON CREATING BLENDED EXPERIENCES

- Establish your curatorial, interpretive, and design intentions. Then think about how these intentions can be realized through various media (built, static, digital, audio/video) and strive for a blend of media types.
- Ensure the experience design is not overly passive (read, watch, listen) nor overly active or interactive (getting visitors to constantly perform a task).
- Consider the opportunities that digital media/technology can play in extending the project to remote audiences. Note which of these design media/technology tactics can both increase remote access and increase inclusive design and accessibility for all persons irrespective of ability/disability.
- Include digital designers in the concept, schematic, and design development processes, and make them a part of the exhibition core team.
- Understand the licensing and rights implications of your content (ensuring that it allows remote audience engagement).

posters and know they will appear not only online but in gallery wherever the exhibition is next presented.

‘Sight Unseen’ Exhibition

In the “Sight Unseen” exhibition, a photography show, all the work was created by photographers who are blind, challenging visitors’ preconceived opinions about “perception.” Not only was I intrigued by how we might interpret this within a human rights context, but I was equally excited by the exhibition design potential.

I wanted to push the inclusion and accessibility of this show while making a passive exhibition (2-D artwork) both active and interactive. We did this a number of ways, including translating photos to tactile relief, providing audio-described images, and enabling visitors to create their own tactile images through a facilitated station.

We also challenged visitors to use an iPod Touch device with the screen turned off to take photos using the accessibility features inherent to the device. The resulting images were hashtagged and posted to Instagram and aggregated into a Tumblr page. This page was then projected in the gallery, within the context of the exhibition, democratizing the content presentation in a fine art exhibition. The accompanying social media campaign encouraged anyone to participate in the challenge using their own devices, and thousands of photos were contributed by people who never visited the exhibition in person.

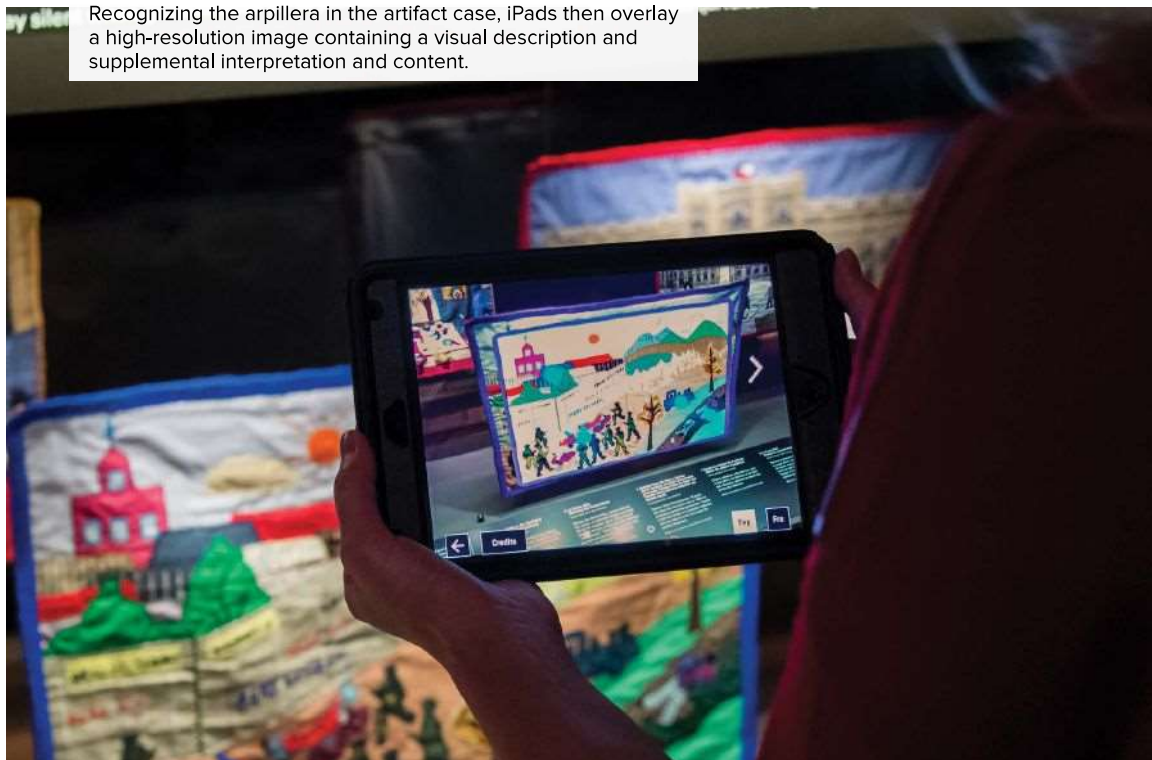
‘Stitching Our Struggles’ Installation

Arpilleras are patchwork textiles that were made and used in Chile during Augusto Pinochet’s military dictatorship to denounce the regime’s human rights and civil liberties abuses. These rich textiles were presented under low-lighting conditions in environmentally sensitive cases that strictly control humidity and temperature. The typical limits of physical exhibition design also meant that interpretive content was minimal due to the practical constraints of label sizing.

Using augmented reality, I wanted to increase detailed artifact exploration, extend the experience to remote audiences, provide supplemental content and interpretation, and increase the artifacts’ accessibility



Recognizing the arpillera in the artifact case, iPads then overlay a high-resolution image containing a visual description and supplemental interpretation and content.



for audience members who were blind or low vision. We provided supplemental audio, video, and text through hotspot buttons that when clicked provided a guided audio tour of the artifacts and their details. Visitors could use iPads installed in the gallery or download the *Stitching Our Struggles* app on their own devices.

The same image recognition technology that launched the AR content in the gallery could also work with any image of the arpilleras. Therefore, educators could use the app in classrooms, visitors could revisit the content at home, or those who never made it to the museum could explore these important stories just as thoroughly as visitors in the gallery. Visitors who otherwise would not have been able to see the artifacts could view them through an iPad display and could zoom in, adjust screen brightness, access visual descriptions, and navigate the artifacts via text-to-speech.

Building on What We've Learned

While I have focused on exhibitions, the same tactics and thinking apply to education, public

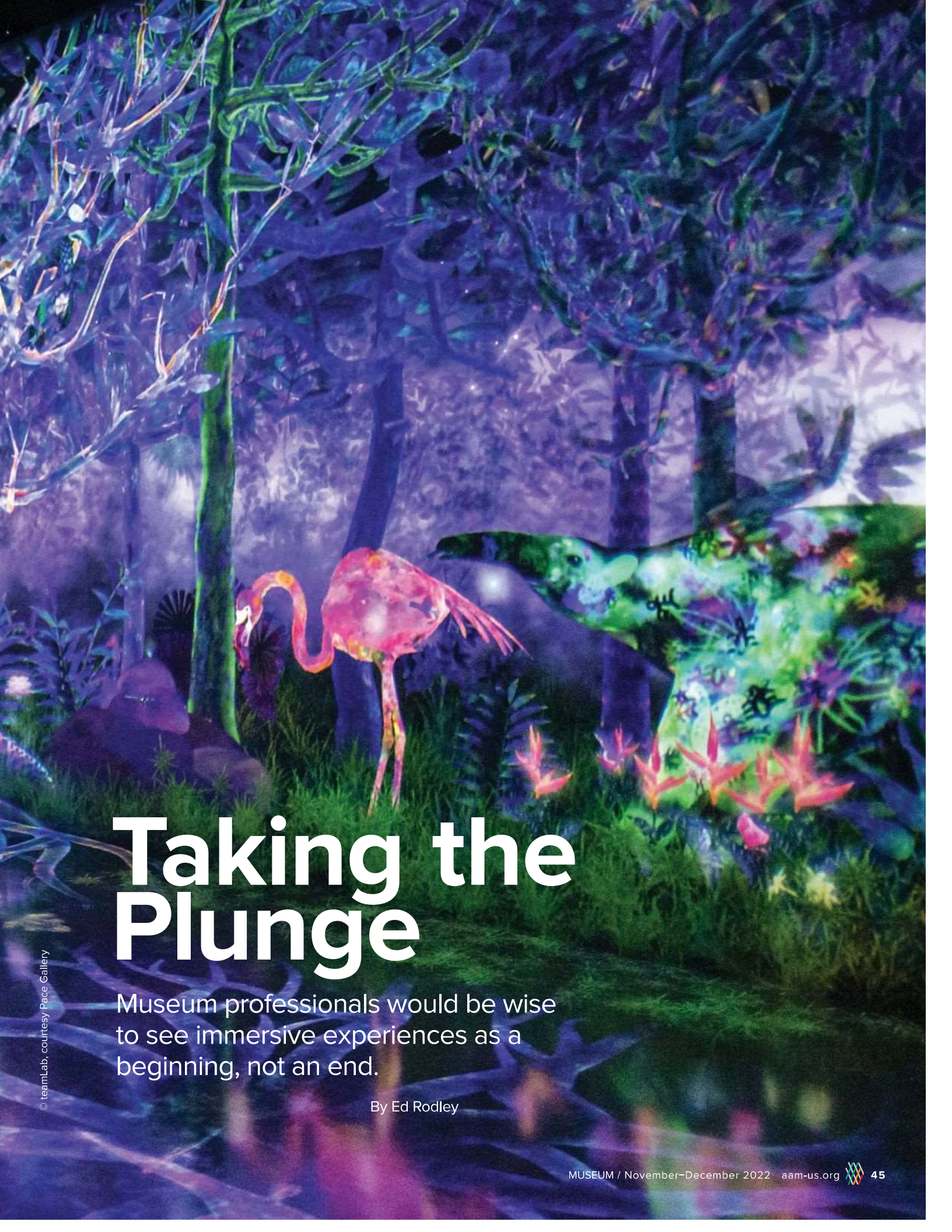
programming, and events. Over the course of the pandemic, countless conferences, symposia, conventions, and meet-ups went online out of necessity. Media and technology can continue to facilitate blended events, opening museum programming to wider audiences, including those who are geographically distant or might otherwise face barriers to participation.

Blended programming provides a greater return on a museum's investment and insulates this investment against unexpected global events while pluralizing, diversifying, and ultimately engaging more people in ways that are meaningful, relevant, and accessible to them.

Corey Timpson is a recognized expert in multisensory experience design and digital media. He was the project director for the design-build of the Canadian Museum for Human Rights and served as its vice-president.

Art collective
teamLab's "Catching
and Collecting
Forest," an
interactive digital
installation in
Fukuoka, Japan.





Taking the Plunge

Museum professionals would be wise to see immersive experiences as a beginning, not an end.

By Ed Rodley

© teamLab, courtesy Pace Gallery

The past two years have seen an explosion of visitor attractions and museum experiences that have highlighted their “immersive” nature. In 2021, there were dozens of different digital technology-based “immersive experiences” on offer in the United States alone. Corey Ross of Lighthouse Immersive, the company responsible for a dozen of the almost 50 immersive Van Gogh shows touring the US, said his company sold 4.5 million tickets through the end of 2021, generating roughly \$250 million in revenue.

I’ve been making visitor experiences in museums for over 30 years, and I’ve watched the explosive growth of this industry with equal amounts of interest and dread. I’m interested in how people are experimenting with engagement, and I dread the way the museum community has largely missed the potential that these immersive experiences hint at. Museum and cultural professionals have spilled far too much ink debating whether these immersive experiences count as “authentic” art experiences and not nearly as much wondering why millions of Americans are deciding they’d like to spend their free time in an immersive environment and are choosing *not* to go to a museum to do it.

The Immersive Landscape Today

Millions of Americans are spending time and money at experiences devoted to “name brand” artists like Van Gogh, Klimt, Kahlo, Michelangelo, Monet, and others. Why not “Immersive Caillebotte” or “Crivelli: The Immersive Experience”? If visual immersion were the only determining factor, then one gigantic image is much like the next.

I think visitors want an aesthetic experience and are using the known members of the Western art canon as a proxy for quality. They are motivated by a desire for a restorative experience, a type of visitor identity learning expert John Falk calls “rechargers” or “spiritual pilgrims.” And while one strand of the current immersive experience is the “dead artist whose artwork is in the public domain,” there is also a separate trend: large-scale, artist-led immersive experiences that create new experiential art.

For example, teamLab, an interdisciplinary, international art collective whose practice navigates the intersections of art, science, technology, and the natural

world, has been conceiving and developing large-scale digital immersive installations for over 20 years. These experiences not only overwhelm the senses but also allow visitors to interact with the environment. In “Catching and Collecting Forest” at teamLab Forest Fukuoka in Japan, visitors can interact with the digital images of animals that roam the space. They can also use a smartphone app to “capture” animals for study, removing them from the environment as they appear in the visitor’s phone. When they’re done, they can return their animal to the larger environment.

Similarly, Santa Fe-based Meow Wolf, another artist collective, aims to inspire creativity through art, exploration, and play so that imagination can transform our worlds. Since 2016 Meow Wolf has been creating gigantic physical environments that encourage exploration and interactive storytelling. “Convergence Station,” their third permanent exhibition, opened in Denver in 2021. This 90,000-square-foot installation introduces visitors to the “Quantum Department of Transportation” and allows them to enter multiple immersive environments as they explore city streets, alien worlds, and giant sentient plants. Throughout their time at Convergence Station, they can also explore a mystery story about four forgotten women and a mythical gateway to the infinite.

The Hallmarks of Immersion

Immersion is clearly having a moment in both digital and physical terms, but what is it about immersion that is so compelling? In her seminal work “Hamlet on the Holodeck,” media theorist Janet Murray defined sensory immersion as “a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from air, that takes over all our attention, our whole perceptual apparatus.”

Entering an immersive experience is akin to diving into a pool. All your senses are activated as your brain attempts to understand what’s happening. Immersion also requires two environments that are substantially, noticeably different. We are always immersed in whatever environment we are in. But just as it’s hard for fish



The “Carne y Arena” exhibition blends VR with the physical environment to create an immersive experience of migration at the US-Mexico border.

to see the water they swim in; we take our default environment for granted once we understand the rules.

Immersion is, in one sense, the act of transitioning between environments and being aware of the transition. This distinction is critically important to us as experience designers. As Seb Chan, Director of the Australian Centre for the Moving Image, says, “Immersion matters to create a distinction between the outside world and inside the exhibition, a magic circle where visitors gain superpowers.”

Three factors encourage and sustain that sense of immersion: attention, intrinsic motivation, and agency.

Attention

Psychologist Daniel Kahneman has proposed a model of how our brains process incoming information, arguing that we employ two attention systems: System 1, which is fast and intuitive and requires little effort, and System 2, which is slow and logical and requires conscious effort. We have evolved to process as much of our world as possible using System 1 so we can save our finite brainpower for situations that require it. Walking down a familiar street is an example of System 1 thinking. You don’t have to think about it,

you just do it. Locating your friend’s face in a crowd? That requires System 2.

Immersion triggers a shift in how we pay attention. In terms of Kahneman’s model, Attention System 1 stops and System 2 takes over as our brains try to answer the questions “Where am I?” and “What new rules apply?” The bewildering environment of an immersive experience, with things happening on every surface around us, makes us pay attention in a way we don’t in a familiar setting like home, work, or a museum. “Immersive Van Gogh” and its competitors do a great job of grabbing visitors’ attention, though it’s arguable how well they hold that attention.

Intrinsic Motivation

This should come as little surprise to museum professionals, but visitors’ intrinsic motivation plays a large role in whether an experience feels immersive or not. Samuel Coleridge described what readers of literature do as the “suspension of disbelief.” Murray reframes that notion and argues that what people engage in is the “active creation of belief.” Because we want to feel immersion, we focus our attention on reinforcing our perceived reality of the experience.

This is why low-resolution virtual environments can feel immersive, even though their appearance is objectively simpler than reality. We fill in the gaps with our imagination.

Agency

The agency visitors possess to navigate and interact with the environment is important. Since part of the immersive experience is the transition from the default environment to the new one, the metaphor of “visiting,” with all its associations of self-directed travel and foreignness, helps promote a feeling of agency, what Murray calls “the satisfying power to take meaningful action and see the results of our decisions and choices.”

I have often witnessed visitors in projection-based immersive experiences use their body to try to interact with the image, holding up a hand

to see if anything changes as a result. In the case of most commercial experiences, the answer is no, but just moving around the space, and seeing how the view changes as you move, can be pleasant. But there could be so much more.

Immersion as a Beginning

A lot of the criticism leveled at immersives boils down to “they don’t teach visitors anything.” Whether that’s a valid critique is a whole other question, but behind that critique is a feeling that an opportunity is being squandered. Motivated, attentive visitors aren’t being given opportunities to satisfy all of their desires.

I’ve always thought of immersion as a gateway to deeper engagement, not an end unto itself, but struggled to put a theoretical framework around that feeling until I came across game scholar Mark Wolf’s work on immersion. Wolf describes a continuum

Visitors at the Cleveland Museum of Art use Microsoft HoloLens headsets to view a mixed-reality scene.



Cleveland Museum of Art

of engagement where immersion is only the first of four levels of potential engagement a person might have with the imaginary worlds game designers and authors create:

- **Immersion:** the process of transitioning between distinct environments and being aware of the transition.
- **Absorption:** the act of having your attention and imagination pulled into the imaginary world of the experience so that you mentally leave, or at least block out, your physical surroundings.
- **Saturation:** the state of having your full attention, concentration, and imagination occupied, often with more detail, nuances, and subtleties than can be held in mind all at once.
- **Overflow:** the satisfying realization that the imaginary environment is just too big, and you can never hold the experience entirely in your mind.

The idea that immersion is not an end but a potential beginning for engaging visitors is powerful. Let's look at three recent immersive exhibitions that show how museums are experimenting with this continuum of engagement.

In “Revealing Krishna,” created by the Cleveland Museum of Art, a traditional museum exhibition is combined with immersive video and headset-based mixed reality to explore a Cambodian statue of the god Krishna and give visitors a sense of its original home in the temple of Phnom Da. Rather than relying solely on immersion, the museum has carefully chosen to augment its modes of display. Visitors can dip in and out of different immersive moments while having a traditional object-focused experience.


“Carne y Arena (Virtually Present, Physically Invisible),” a hybrid physical/virtual immersive experience by movie director Alejandro Iñárritu, has been featured at multiple museums since its creation in 2017. A visceral exploration of migration across the US southern border, it creates its immersion by blending a VR narrative with a real physical environment that reinforces the feeling of being in the desert. Visitors can view an unfolding story of an encounter

between migrants and law enforcement officers from any vantage point they choose as they move around the space. After the immersive VR experience, visitors enter a final gallery where they learn more about the issue and the people they saw in the immersive gallery. The immersion is used to prime visitors for a physical absorption experience.

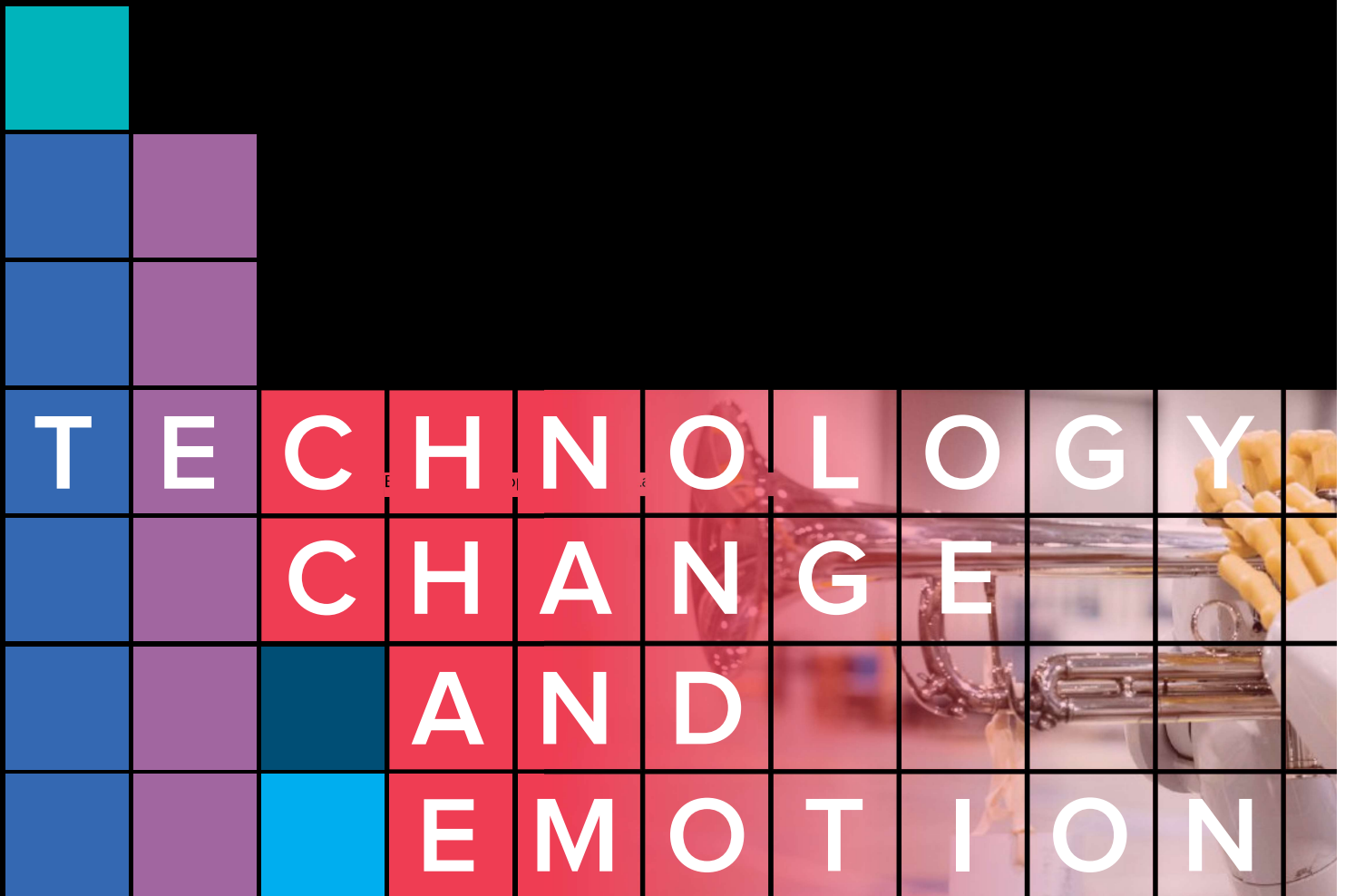
“Connected Worlds” at the New York Hall of Science is a large-scale interactive ecosystem composed of six different habitats, connected by an interactive floor and a 45-foot-high digital waterfall. Visitors can not only inspect the space but can reshape the environments through their actions. This exhibition immerses viewers in its world and teases them with glimpses of ways they can interact with and change the world. Some seeds can be “caught” and planted, causing new plants to grow. Physical logs can be moved around the floor to divert projected water flow into the habitats, causing plants and animals to grow and thrive. The exhibition immerses and absorbs visitors as they experiment and discover the limits of their agency. Interacting with the space increases visitors’ interest in the content and the amount of time they devote to the experience. I would argue it comes close to saturating those visitors who engage with it.

What kinds of experiences might we design if we took Wolf’s model to heart? Wolf draws his examples from the worlds of game design and television, where tools like story bibles—compendia of all the characters, objects, and plot lines of the story world—are essential resources to the teams of people creating the experience.

What would your next exhibition look like if you conceived it as a story world within which visitors were able to climb the engagement ladder that begins with immersion? Where might we take visitors if immersion were only the first step of that journey rather than the end point?



Ed Rodley is Co-founder and Principal of The Experience Alchemists (theexperiencealchemists.com), an experience design firm serving the cultural sector.



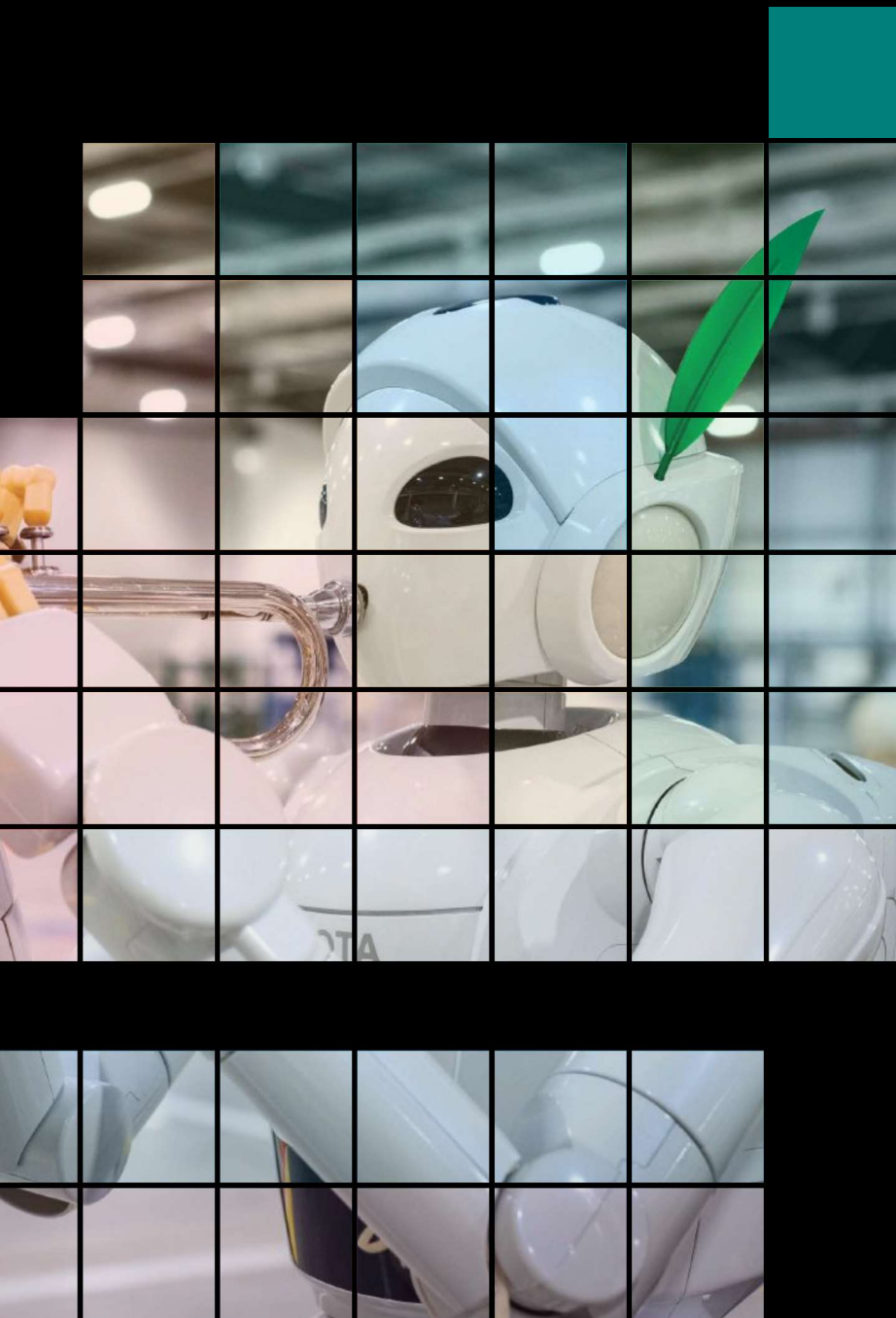
TECHNOLOGY CHANGE AND EMOTION

The Trumpet
Player Partner
Robot lives in the
Science Museum
Group's collection
management facility.



What it means to build a human-centered
approach to digital leadership and skills.

By Ross Parry, Sophie Frost, and Lauren Vargas



People drive digital

change in the museum. Irrespective of the focus on technology—hardware and software, standards and systems, products and platforms—it will always be the leaders and staff, the partners and stakeholders who enable the digital capability of museums.

And yet, the lived professional experience of individuals within museums working on digital change is little understood and much overlooked. Plainly put: the very dimension that we now know is fundamental to digital change in the museum is that which—in our practice and scholarship—we know the least.

Museums today not only are attempting to understand new forms of visitor participation and digital experience but are doing so within a moment of both institutional and individual precarity, making essential the need to understand the human (and not just the technical) dimension of museum digital change. Over the last two years, an international research collaboration has been investigating this human dimension along with how we define “digitally mature” in the museum space, why it matters, and how we can help museums get there.

Part of the ongoing One by One research consortium, “3 by 3” is an 18-month, multipartner, transatlantic collaboration bringing together cultural institutions, academics, and professional organizations to help

museums navigate digital change (see “A Unique Collaboration” sidebar on p. 54 for participants). The project has asked what new models of “empathic leadership” could enable the holistic institutional adoption of (and adaptation to) digital, what inequalities exist in the landscape of digital change in museums, and how these inequalities can be confronted. In doing so, “3 by 3” has attempted to highlight what successful digital leadership in museums looks like in human, not just business and technological, terms.

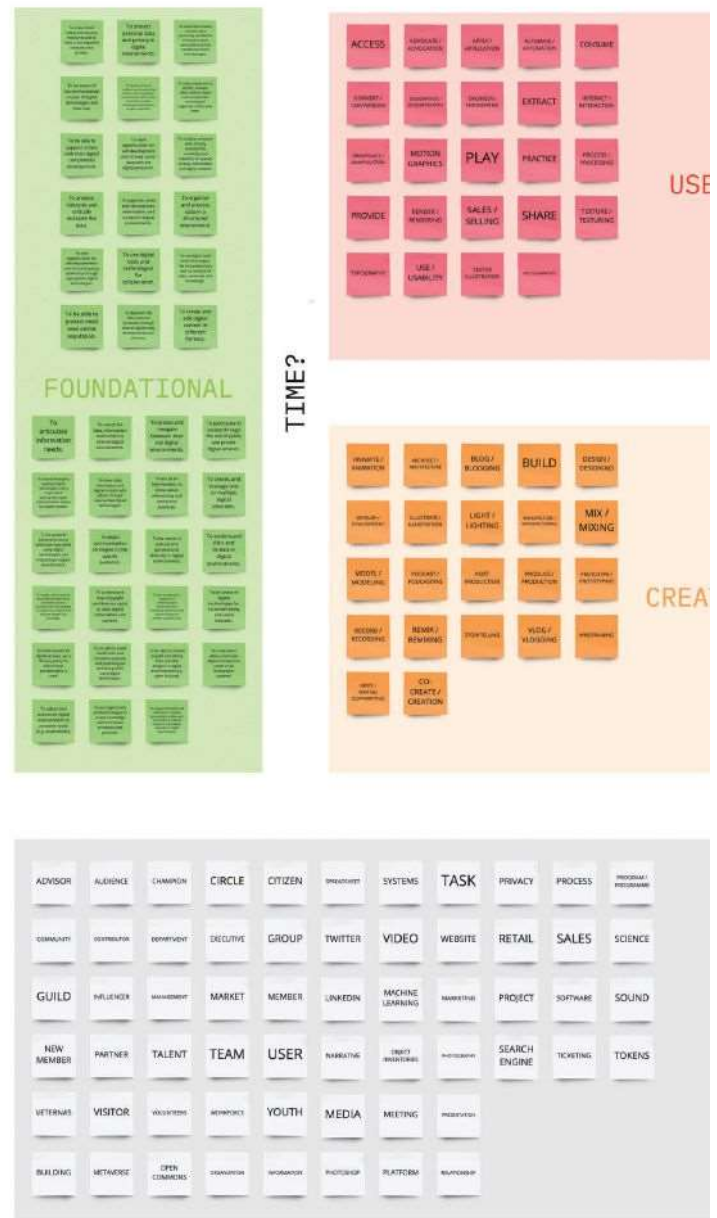
Embedding the Emotional in Digital

One “track” of the project has investigated the development of digital skills in the museum workplace. Previous work by the One by One team has shown the extent to which museums struggle to formalize the development of digital skills within their workforce, even lacking clarity on the definition of “digital skills” in a museum context. This latest study considers how we might close this gap between identifying skills and ensuring that the right skills are performed at the right time.

The project’s researchers employed a series of prompts and exercises (such as audience experience mapping) with project museums to delve deeper into the communication, collaboration, and digital skills development areas that would enable digital transformation. These activities were occasionally offered to the entire research cohort to complete together; otherwise, research partners conducted these activities with their respective museum teams. The prompts and exercises revealed opportunities for museums to achieve greater digital impact as they thoughtfully consider how digital is understood, used, managed, and created across their organization.

Following this fieldwork, 18 monthly book club study sessions, and the close review of over 250 museum digital job descriptions, the project created a new framework for identifying and articulating digital skills for museum workers. The new framework shows the combinations of technical, business, and emotional skills that together comprise digital skill in the museum.

Conceptually similar to the Periodic Table of Elements, the Periodic Table of Skills (PToS) is a



framework to help museums understand and identify patterns and connections between skills while also acknowledging the human and emotional dimension to digital capability. The PToS currently has 207 skills across seven dimensions. These skills include foundational digital literacies, such as “to understand risks and threats in digital environments,” and emotional skills, such as being “inclusive” and “self-aware.”

The elements listed in the PToS are meant to be considered in combination with each other and their organization’s unique context and characteristics



LITERACY - MASTERY SPECTRUM?



(i.e., domain-specific knowledge and technologies within the organization's digital ecosystem). Doing so showcases the depth and breadth of digital capabilities such as "online community management" and "data management" and indicates the level of mastery needed within the organization.

This is much-needed clarity. After all, how can we develop skills if we are not clear what those skills are or how they are used in different combinations to achieve specific outputs and outcomes? One by One's Periodic Table of Skills can potentially

help individuals, teams, and organizations embed digital literacy into all job roles and functions; develop right-size job descriptions, professional development, and performance plans; and improve employee experience.

The Hidden Emotionality of Digital Work

Complementing this new framing of digital skills and capabilities, the second research track focuses on everyday digital practices and behaviors across an organization and its workforce.

The Periodic Table of Skills (PToS) is a framework to help museums understand and identify patterns and connections between skills while also acknowledging the human and emotional dimension to digital capability.



RESOURCES

Periodic Table of Skills

miro.com/app/board/uXjVOuggJt0=

The Hidden Constellation podcast series with Dr. Sophie Frost

shows.acast.com/thehiddenconstellation

People. Change. Museums. podcast series with Dr. Sophie Frost

leicester.figshare.com/collections/Voices_of_the_Royal_Pavilion_Museums_podcast/5118557

The Digital Culture Compass

digitalculturecompass.org.uk/

One by One case studies and guides on Culture24's Digital Pathways

bit.ly/3coC8Wd

A year-long study by the Science Museum Group (SMG)—five UK science and technology museums—culminated in the October 2022 launch of *The Hidden Constellation*, a research podcast profiling the new, hidden, distributed, legacy, and collective forms of digital work taking place across this group. The premise of *The Hidden Constellation* is that emergent forms of digital labor in museums make up a constellation that when plotted and connected reveal a pattern of work that is as complex, overlapping, or hierarchical as more familiar and visible kinds of museum labor.

Often intangible, location-specific, under-valued, or under-articulated, this new constellation operates and agitates alongside other, more traditional forms

of curatorial, conservation, and collections management work in the museum. Moreover, new forms of digital curatorship, digital content generation, hybrid working models, and the increasing role of data analytics are influencing, and sometimes reinforcing and even disrupting, previous modes of power, knowledge, and expertise within the museum. Digital work in museums, as well as digital volunteering, digital storytelling, and other forms of digital participation, are giving rise to new, virtual, and hybrid opportunities for empathetic and supportive dialogue. This is pushing at existing institutional boundary lines; propelling play and experimentation; and—most significantly—inviting more people to the conversation.

This research has found that emergent practices of digital labor—in already digitally confident museum spaces such as Science Museum Group, at least—are collaborative, open-sourced, and radically transparent, involving a kind of maker culture or do-it-yourself ethic. This was evident, for example, in the meme collecting project led by the National Science and Media Museum (Bradford) in collaboration with Dr. Arran Rees from the University of Leeds.

The team decided to collect the Museum of English Rural Life's infamous "absolute unit" tweet. This featured a 1962 photographic image of a farm animal—an Exmoor Horn ram—on sale at a livestock auction in Somerset, England. At the time of original posting in 2018, this tweet was widely recognized by the museum world as a viral sensation, receiving over 100,000 likes and 29,000 retweets.

A UNIQUE COLLABORATION

Led by the University of Leicester and Southern University at New Orleans (and advised by experts at Harvard University and Johns Hopkins University), the "3 by 3" research project has been a unique research collaboration. It has brought together the leading sector bodies in the UK and US: the American Alliance of Museums with the UK's Museums Association, and the Museum Computer Network (US) with the Museums Computer Group (UK).

At the core of the project is a transatlantic partnership of cultural organizations, with digital leads across the Smithsonian Institution partnering with their counterparts in the Science Museum Group, Victoria and Albert Museum, Amgueddfa Cymru—National Museum Wales, and National Museums Scotland.

This project forced the museum's existing collections staff to evolve how they think about ownership as well as how they collect a born-digital object with many component parts, including a TIFF, a Twitter handle, and a series of Twitter responses and follow-up memes. It revealed the need for more digital preservation skills among staff along with new ways of thinking about curatorship when you catch a meme "in the wild," which is likely to evolve online after it has been acquired.

There is an inherent emotionality to the "new power" philosophy—to borrow from Henry Timms and Jeremy Heimans' 2018 book of the same name—behind much of the digital labor at Science Museum Group. It is quietly disrupting some of the more formal "old power" principles—the more managerial, exclusive aspects that are premised on an unwavering belief in the expertise of curators and on the long-term affiliation and loyalty of established audiences—that are foundational in many of today's museums.

This latest research found that emergent digital labor involves intentional, purposeful, and effort-based actions of all who undertake it: in other words, it involves emotional labor. Often overused, this concept remains useful in the study of museums' digital transformation work because it encompasses the need for analytical and intuitive skills, the understanding of various individual aspirations, and the well-honed interpersonal and negotiating skills required to broker digital change. However, this research has shown that, while emotional labor can enter museum technology discourse in productive ways, it can also be the source of exhausting, exploitative practices.

The One by One team's ongoing research has found that, rather than uncritically accepting changes to museum working practices brought about through technological change, we must begin to question how digital labor is shifting experiences of work, including new kinds of under-articulated and hidden digital work now commonplace, such as in the realms of social media community management and content generation, museum documentation, and archival work. At the same time, we need to remain aware of how the emotional aspects of new forms of digital work in museums are precisely what is enabling emergent



kinds of curatorship, programming, expertise, and participation.

Successful Digital Leadership

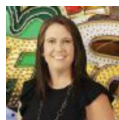
These two tracks of research have taken very different approaches: one a systematic study across multiple organizations informed by business process maturity modeling and the other an institutional ethnography centered on one museum group. Furthermore, each has produced different signature outputs: one an extensible framework for plotting evolving museum digital capability and the other episodic insights into the hidden emotionality of everyday digital work in the museum.

Both projects represent an "emotional turn" in museum technology. They highlight the importance of emotions and the subjectively experienced feelings that underpin digital transformation work in museums. Crucially, this research tells a story of museum digitalization in human, and not just business and technological, terms.

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TRIBUTES AND TRANSITIONS

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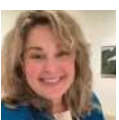
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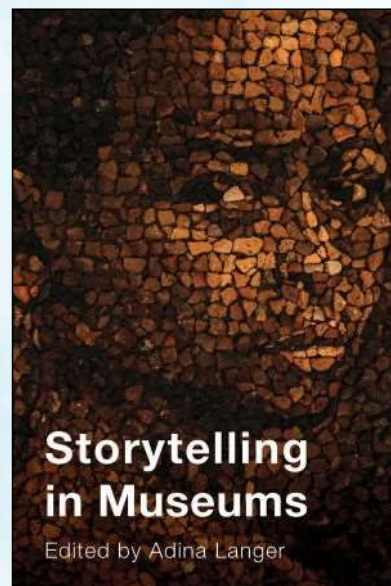
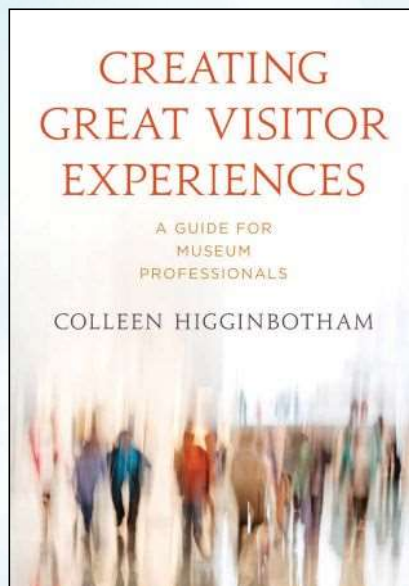
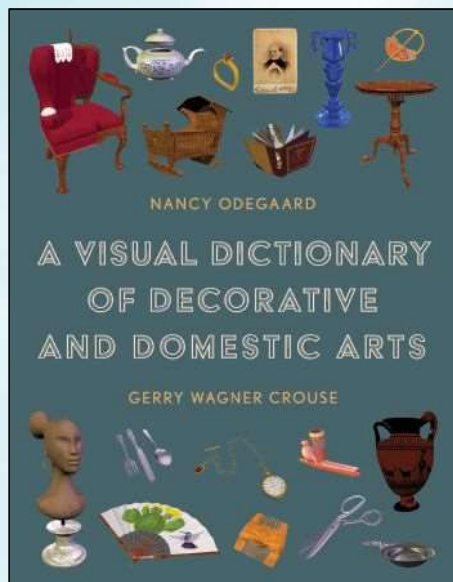


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