

Bringing it Home

Experimenting with
a Nontraditional
Exhibition Space

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Augmented reality (AR) has given us the ability to tie digital experiences to physical places and objects. It is the technology that allows smartphone games like Pokémon GO to create the illusion of inserting artificial, three-dimensional objects into physical space, and it is a new frontier that museums – including the Henry Ford Museum of American Innovation in Dearborn and the Metropolitan Museum of Art in New York City – have begun testing as a new way for audiences to explore their collections.

The Akron Art Museum was awarded a Knight Foundation grant to further those explorations of what museums can do in AR, with work beginning in early 2020.¹ The grant had two key requirements: 1) use AR and 2) bring art to audiences beyond the walls of the museum (or, to put it another way, develop an AR project that dissolves the commonly perceived barrier between a museum and the city in which it is located). The grant was an exciting opportunity to experiment with non-interpretive, non-gallery-based uses of AR that incorporated both artists and the general public.

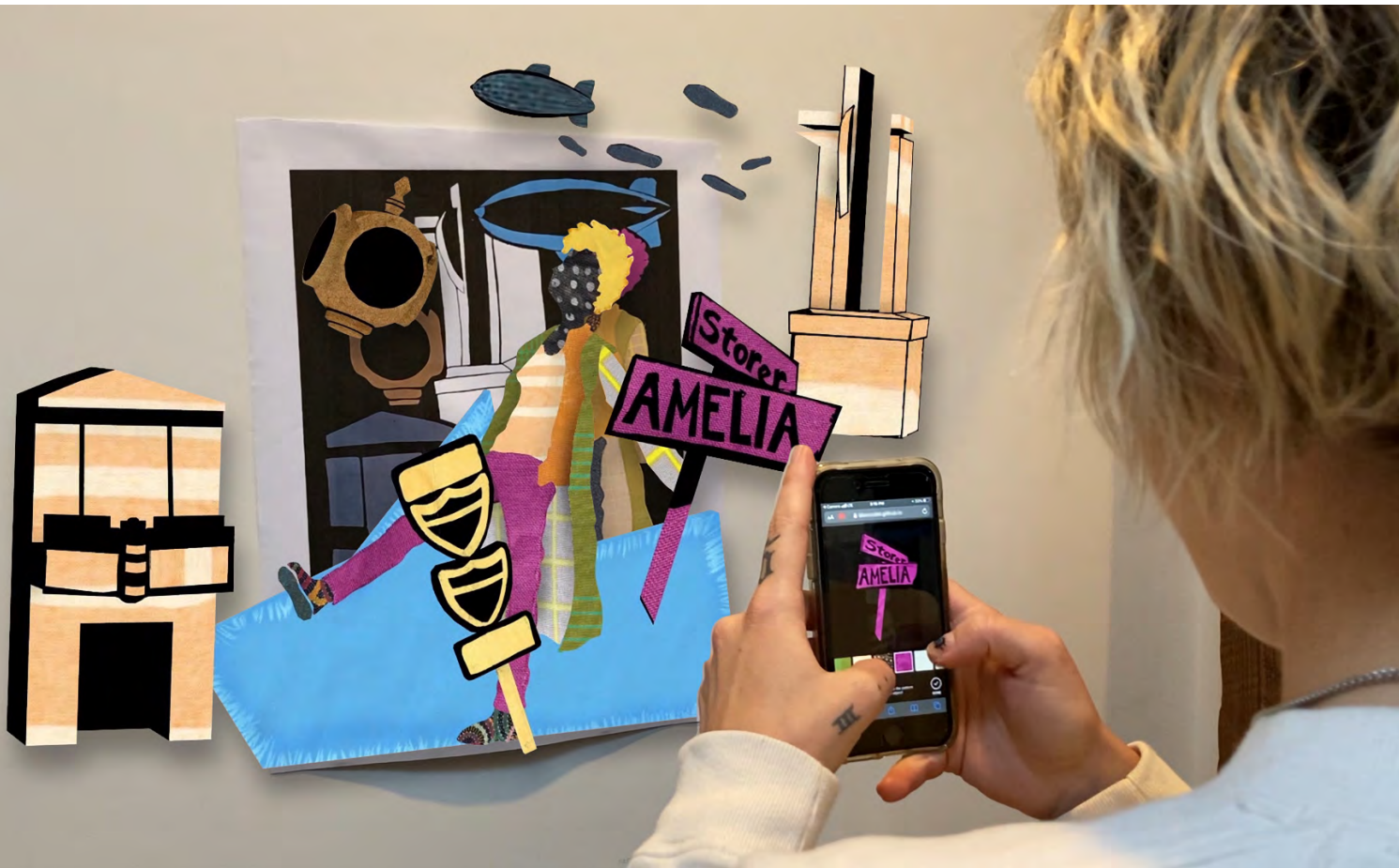
Staff from the Akron Art Museum and Bluecadet held the first planning meetings just days before the COVID-19 pandemic led to state-mandated lockdowns and museum closures. The world was shifting and the future was uncertain. To keep the project on track, we had to stay nimble. We did that by sticking to a clear set of goals, but also being open to experimentation for how we would reach them.

Fig. 1. An InterPlay user activates the artwork depicted in Adana Tillman's poster and manipulates augmented-reality objects through their phone. View the poster and activate the experience at: akronartmuseum.org/interplay.

The final result is InterPlay, an interactive art experience that the museum launched in December 2020. InterPlay uses Web-based AR to turn any home into a world-class art gallery and every viewer into a creator (fig. 1). The user simply scans the QR code on a poster featuring the work of an artist (for this project, textile artist Adana Tillman) and the artwork comes to life on the screen of their phone or tablet, jumping off the page as 3D objects floating in space. We distributed the poster for free throughout local shops in Akron and as a downloadable file on the museum website, so users might discover the poster taped to the window of a coffee shop or they could take a copy to display in their own home. Through their own devices, users can play with the art by moving components around, inserting new ones, or changing colors and patterns. They can save these new creations and share them with friends. The name InterPlay is meant to evoke that opportunity for interaction and the spirit of playfulness. It's a digital exhibition in your living room. The result is an intuitive, rewarding, and accessible experience that's given the museum a new perspective on the power of art.

New Priorities, New Concepts

Like almost anything during this previous pandemic year, the final version of InterPlay wasn't quite what the museum had set out to build. In our early discussions, one question we asked was, "How can the Akron Art Museum be more about Akron?" When the project kicked off in early March 2020, that goal seemed straightforward. Then, Ohio issued a mandatory lockdown order.



Our rough initial concepts were largely centered on gathering strangers together or activating civic spaces where people already come together in large groups (for example, community gardens or public transit lines). With the doors of the museum temporarily closed, gathering suddenly off the table, and public transit use declining significantly, we had to adapt. Augmented reality went from being one component of the project to *the way* to get users thinking about the city beyond their living rooms. Rather than using AR to bring the museum into Akron, we would use art and AR to bring Akron to users.

As our work shifted course, we were guided by two principles: prioritize building the easiest-to-access and easiest-to-use experience within the bounds of our grant, and use rapid prototyping to adapt the experience for our uncertain new world.

We took access and usability to mean that whatever we built would have to be easy to operate without (for example) a museum educator or a long list of instructions, things that might have been feasible for a comparable experience inside of a museum. With so much uncertainty around the length of the lockdown, the final experience had to be usable within the home. Because we were working with AR – an unfamiliar technology for many people – we needed a solution that would be intuitive to get working and not too much of a technological heavy lift for users. We were confident it was possible, but only if we kept those principles in mind.

Choosing a Platform

Almost anything you do on a mobile phone will happen one of two ways: through a native application or through a Web browser.

A native application is the term for the kind of app that you download from Apple's App Store or Google Play and run off of your tablet or phone like a piece of computer software. Unlike a website running through a browser, native apps can harness the full processing power of the phone or tablet on which they run. To understand the difference, try using the Facebook app and then visiting facebook.com through your phone's Web browser. While both options will let you see your friends' latest vacation photos, the native app provides more features and a much smoother experience.

Alternatively, Web-based solutions are a burgeoning new option for AR – experiences that run entirely in a Web browser.

Typically, mobile-based AR experiences take place through a native application. These native apps are powerful, accurate, and full of exciting features. Want a detailed 3D figure to wander across your kitchen table and know when it is about to fall off the edge? That is going to require a native app.

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Augmented reality through a browser does not have quite as many bells and whistles, but for simple AR experiences, it works just as well. And Web-based AR has a key advantage: no new app download required. Sending users to a URL, rather than the multi-step

process of installing a new app, removes a major hurdle to user adoption. Additionally, native apps need to be developed for Apple and Android operating systems (adding significant costs and lengthening development times), whereas Web-based AR automatically works cross-platform.

If we had started with the aim of building something that would run on phones or tablets owned by the museum, inside the museum, with docents present to help orient users, a native app could have been the right solution. We even could have considered using cutting-edge technology, like sensors in the latest iPhone models that are comparable to what autonomous cars use to “see” the road.

When exploring a new technology, there is a natural inclination to want to push its technical limits and take advantage of as many unique features as possible. However, we chose to prioritize access over flashiness, which meant going Web-based. We sacrificed a few features (i.e., the highest-end sensors, extremely realistic 3D models), but gained an enormous audience – anyone with any kind of smartphone or tablet. The worst possible result for InterPlay would have been to spend nearly a year building a costly native application, only to discover that none of our audiences could actually use it. We chose simplicity. To launch InterPlay, users just visit a URL through their phone's Web browser to start the experience.

Of course, we also had to determine *what* exactly we were going to be building to bring the museum to people in this unknowable new world. When they arrive at that URL for a Web-based AR experience, what should users actually get? To experiment, we turned

Figs. 2 & 3. Early visual prototypes that Bluecadet animated to help get ideas flowing quickly and build excitement for the initiative: interactive digital sculptures, collaborative community-made drawings, and murals with animated AR components. Eventually, we discarded what was not working.

to rapid prototyping, a methodology used by Bluecadet to quickly test lots of ideas, honestly evaluate what works or doesn't, and then discard or iterate.

The Power of Prototyping

Bluecadet's designers started by asking, "what might be exciting to us as designers, to Akron residents as users, and to the museum as a cultural institution?" (not "what would be possible?"). We dreamt big and broad, temporarily letting technical and budgetary requirements take a back seat. The point was to start with expansive thinking, consider lots of ideas to see what might stick, and experiment.

We started with a rough idea of the components that might be involved in what we were building, but not how (or if) they would all combine: AR, the city of Akron beyond the walls of the museum, artwork by a local artist, and user-generated content. We explored solutions like empty pedestals throughout the city that could trigger AR sculptures, blank canvases in bus shelters that could reveal a collaborative community drawing in AR, and an AR-based community garden that would be activated by a mural. To better understand each concept, Bluecadet built animated mockups and visual prototypes and solicited feedback among the Bluecadet and Akron Art Museum teams ([intro image](#) and [figs. 2 & 3](#)). Every idea had its advantages and disadvantages. For example, art in bus shelters could be distributed throughout the city, but could we be confident that people would actually notice and choose to interact with what would initially appear to be a largely blank poster?



Among exhibition developers and designers, there is a traditional idea that prototyping means building a functional version of an invention and sending it to a focus group. Rapid prototyping, though, can involve a much wider range of methods that are faster and less costly. In this case, well thought-out mockups were enough to test assumptions and point us in a productive direction. Rather than dictate a concept on day one, we went through a learning process.

Without prototyping, it would have been easy to select a solution early on, push forward with it, and only realize months later that it was the wrong direction.

As we got further along in testing ideas, we also got under the hood of 8th Wall, the Web-based AR development platform that we had chosen. Through our research in existing Web-based AR solutions, 8th Wall, founded in 2016 by former Facebook and Google engineer Erik Murphy-Chutorian, emerged as the most powerful option, thanks to providing a strong set of features while maintaining a smooth user experience. Still, we tested the platform's technological boundaries, even getting in touch with the platform's founders to better understand what was possible. We also realized that some of our earliest ideas just would not translate to 8th Wall, and since we were

prioritizing access, we refocused our energies accordingly.

Between experiments with 8th Wall's capabilities and prototypes for how to insert AR into every nook and cranny of the city of Akron, our team turned a corner from apprehensive to excited, maybe even over excited. We had too many ideas. It was time to find some clarity.

The last piece of the puzzle was commissioning an artist to work with Bluecadet and develop artworks for an AR environment. In finding an artist, the Akron Art Museum looked for someone early in their career, with strong ties to Akron, and no prior digital art experience, believing that such an artist would be well suited to work with us while we experimented with ideas and new technology. That led us to Adana Tillman, an Akron-born textile artist. She became the first person to show her work on what would become the InterPlay platform. Once we realized that the realities of a pandemic and a statewide lockdown would not allow us to, for example, collaborate with a community garden or do anything that involved gathering, we realized that we needed an artist with strong connections to Akron, who could bring the city into their work. Tillman's art has a patchwork style, breaking down into easily separated components, and she was excited to make a work full of references to her hometown. In what was largely a coincidence, this artistic approach meshed quite naturally to the kinds of interactions possible through 8th Wall.

Overall, prototyping was central to InterPlay's success. Due to budget needs, it was critical that we launch within our 10-month project timeline, pandemic or no. Without prototyping, it would have been easy to select

a solution early on, push forward with it, and only realize months later that it was the wrong direction. This was especially true as the evolving pandemic changed what was feasible and relevant. Prototyping kept us quick, adaptable, and on schedule.

Everything Comes Together

The idea we finally moved forward with was informed by the moment, accessibility, our experiments, and our inaugural artist. In a time when many of us were confined to the same space every day, we wanted to create a link to the city outside. It was an adaptation of our early ideas and far from where we initially suspected we might land, but it was one suited to our new reality.

The InterPlay experience starts with an 18" x 24" poster: an artwork by Adana Tillman,

not unlike what you might find in a museum gift shop (the poster can be viewed, and the experience activated, at akronartmuseum.org/interplay). The poster is Tillman's ode to Akron; it references local landmarks like the iconic Highland Theatre, which has been screening film for nearly a century, and the Goodyear Blimp (Goodyear is headquartered in Akron). A small QR code at the bottom of the poster triggers the AR experience. Scan the code with your phone, head to the URL it links to, and Tillman's art jumps off of the page as it transforms into a series of floating 3D objects. Components of the work can be moved, inserted, rotated, and re-patterned (fig. 4). Users play for a few minutes, create something unique, and then save their finished artwork as a photo that can be shared with friends. It's Web-based AR in your home, interactive, and with physical and digital components. More than just a

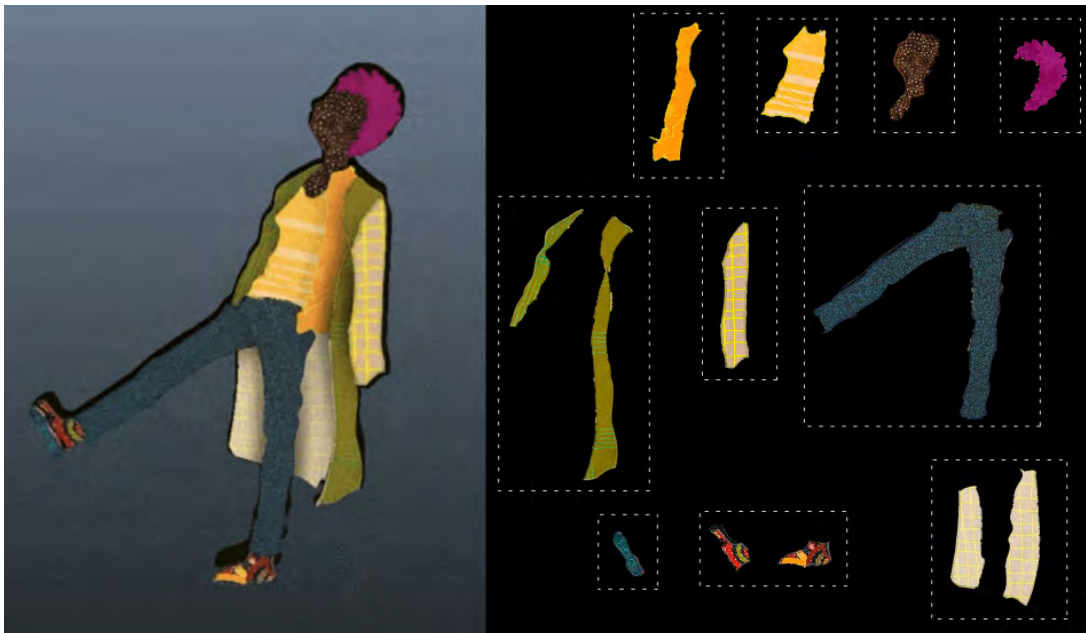
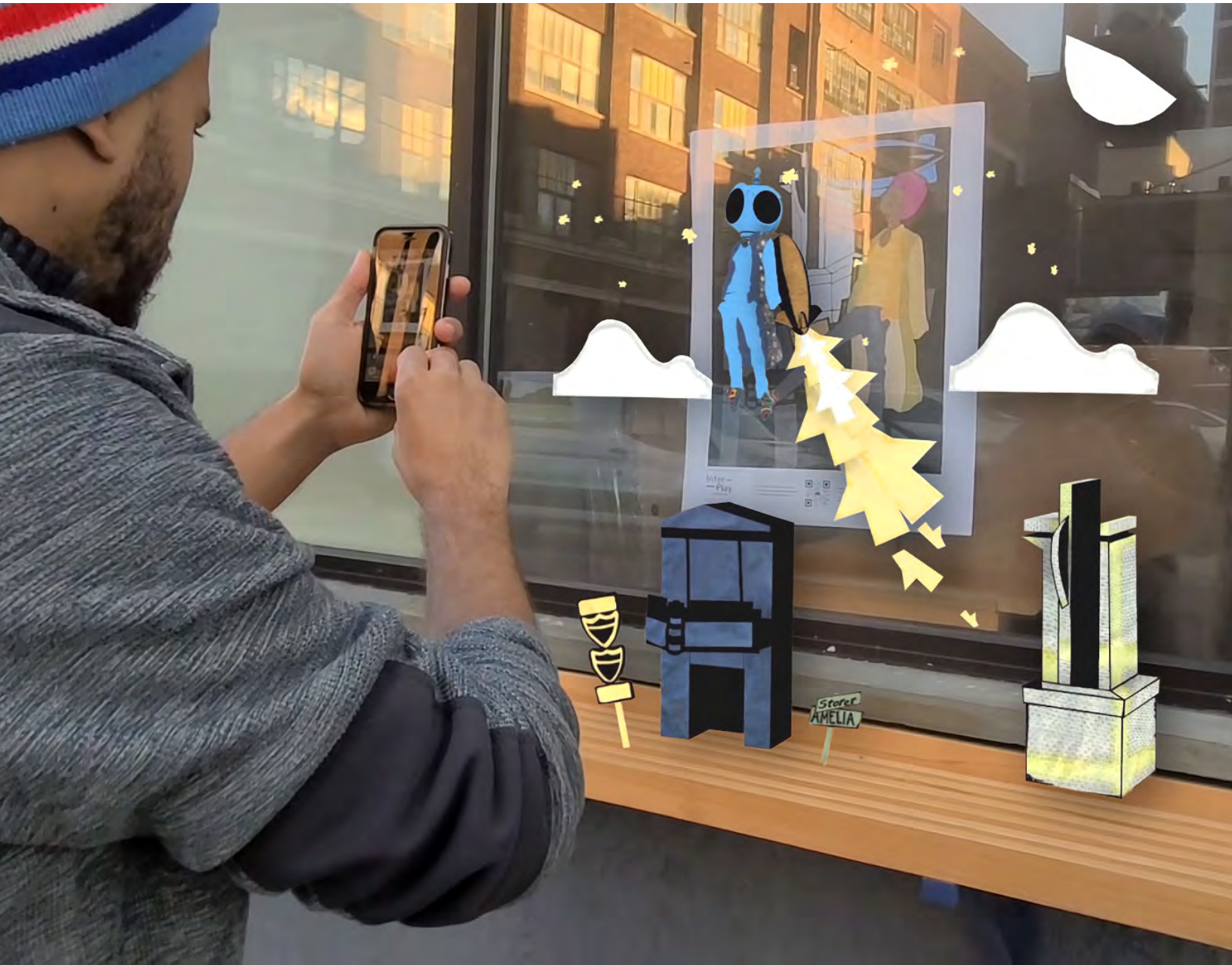


Fig. 4.

One of Tillman's figures broken down into component pieces, each of which could be re-patterned and customized by InterPlay users.

Fig. 5. With AR, objects can appear to pop off of a two-dimensional poster and move through space. Because the platform is Web-based, it's easy for a passerby to access it easily - like this man, who snapped a photo of the poster's QR code and was able to experience InterPlay immediately.



physical poster or exhibition, InterPlay is an art-making workshop that requires nothing more than a QR code and your smartphone.

The Akron Art Museum distributed more than 5,000 posters throughout the city, giving them away for free at essential local businesses like grocery stores and cafes. The museum also made the posters available through its online shop. Since InterPlay launched in December 2020, thousands of Akron residents have been making art on their phones, in their homes, for free. The doors were still closed, but the museum was reaching audiences and engaging with them in a substantial way. InterPlay even jumped beyond Akron's borders, with coverage in publications like *Hyperallergic* and posters mailed overseas.

Takeaways for the Future

What can other museums take from this experience? The lesson from InterPlay is not necessarily to use AR, or that Web-based AR is the future. The lesson that we are taking with us into future projects is to have goals that embrace experimentation and adaptability.

When the Akron Art Museum had to close, it became more important than ever to prioritize access. Apps with all the bells and whistles may look good on paper, but they do not necessarily lead to high adoption rates. There are other approaches to consider.

It's true that a native app could have been more powerful. InterPlay does not have every feature other AR art applications like Acute Art or Artivive have, such as 3D animations that cast realistic shadows.² Tillman's textile and pattern work aligned well to 8th Wall's

capabilities, but not all artworks would have. If we were designing an AR experience with a different audience, setting, or artist in mind, we might have built it differently.

We feel that InterPlay struck the right balance for our particular needs. When you're trying to reach new audiences – and audiences who aren't physically in your space – you have to make it easy and give the visitor a chance to succeed (fig. 5). Prioritizing access and adoption rates was a choice that we made because of the pandemic. As a result, we have thousands of satisfied InterPlay users, with no calls to the museum for tech support.

However, all of that is only clear in hindsight. We got to InterPlay by investing in rapid prototyping, a quick and cost-effective way to test a range of ideas. When you are just testing something out, it's okay to be wrong. The risk of failure is low, and the potential for unexpected discovery is high. To put it another way, it was through prototyping that we opened our eyes to the wide array of directions that InterPlay could take.

InterPlay is undoubtedly a product of the pandemic. It is also a product of actively working to reach new art lovers, bringing the Akron Art Museum out from behind the walls of the museum and into people's lives, and experimenting with what might be possible. ■

1 The John S. and James L. Knight Foundation (see knightfoundation.org) is a national foundation that invests in the arts in cities (such as Akron) where brothers John S. and James L. Knight once published newspapers.

2 Acute Art (see acuteart.com) is responsible for complex augmented-reality projects with artists like Olafur Eliasson. Artivive (see artivive.com) is an AR app on which artists, businesses, and museums can (for a fee) host AR-activated artworks.