



CASE STUDY

Using projection mapping technology to bring art to life

When Lighthouse Immersive undertook the task of reimagining an immersive exhibit highlighting the works of post-impressionist Dutch artist Vincent van Gogh, their first job became finding the perfect space. Once the group made arrangements to house the exhibit in the Toronto Star building, a historic location with deep ties to the greater Toronto community, the team would begin to make plans for the next stage of the project: Designing a setup consisting of a series of projectors that would work in tandem to transform the floors and walls of the industrial space. The finished exhibit would immerse visitors into the works of Van Gogh from every angle.



To achieve this impact, the exhibit had to be designed around the exact specifications of the 1,022 square meters space of the Toronto Star building, according to Lighthouse Immersive Co-Founder and Producer Corey Ross. One of the things that separate this experience from other exhibits, he says, was the way his team eschewed the traditional method of putting up temporary walls or screens for the projections. In this exhibit, the walls, pillars and floors - all made of metal, brick and concrete - are themselves the canvass for the imagery.

CHALLENGES

Design and build an immersive exhibit based on the artwork of Vincent van Gogh that completely transforms the interior of the Toronto Star building by creating a 360-degree experience for visitors. To achieve the effect, the room must be fitted with projectors mapped to the walls that can provide enough precision and detail to create a single, large and seamless image.

SOLUTIONS

Utilizing 53 Panasonic [PT-RZ770](#) laser projectors and an internal network, the Lighthouse Immersive team created a mosaic of images that come together to create a wholly immersive, 360-degree experience. By utilizing the projector's Edge Blending and Color Matching feature, the team was able to match the edges of the individual projectors and create large smooth and seamless images.

RESULTS

Opening amid the Covid-19 pandemic, the Lighthouse Immersive team created a second, drive-through experience, which required an additional 53 projectors and operates in tandem with the traditional walk-in experience. Both exhibits create an immersive experience for visitors and have sold out through their initial run, which has since received glowing reviews in online forums. Lighthouse Immersive has also reported minimal maintenance and upkeep required since the exhibit has opened.

Bringing Van Gogh to life

Sean Richards, Project Manager at Lighthouse Immersive, worked to make these creative concepts a physical reality from a technical standpoint. With 25 years of experience in stage and event design, creating a grid from which projectors could be fastened was the easy part. The hardest part would be designing a layout of projectors that could map to the walls of the Toronto Star building.

To develop the exhibit, Lighthouse Immersive worked with the creative and artistic teams from Europe, and both groups knew the goal of creating a truly immersive experience left little to no room for imprecision. After developing the plans that would allow the team to map the images to the walls, floors and columns of the Toronto Star building, they began looking for projection solutions that would best fulfill these plans.

Finding the right solution

Based on the level of precision needed - and other considerations such as energy usage, heat and durability the team agreed that laser projectors were a better solution than lamp-based alternatives. The design called for 53 projectors to be run in tandem to create images that are 8 meter high and up to 52 meter wide across the building's walls and columns. Ultimately, the team decided to utilize the projectors in portrait mode - as opposed to landscape - to achieve the image height in these designs. This meant finding projectors with flexible installation, superior side-shifting and edge-blending to create the desired immersive impact.



When utilizing side-shifting, the projector is placed at the top of an image, and the optics are shifted to project the image without distortion. Using the Panasonic [PT-RZ770](#) projectors, the team at Lighthouse Immersive was able to maximize the shift, utilizing the 360-degree free installation feature and have the projectors at a maximum downward angle of six degrees with the projector five meters from the wall. This flexibility enables projection from virtually any angle.

"That is a pretty impressive amount of side-shifting considering we're using the projectors in portrait mode," Richards says. "I would've expected that in landscape, but that's a very long image in portrait mode considering the lens is practically at the top of the image and the projector is fairly close to the wall."

Beyond simply side-shifting, these images need to blend at the seams since each projector's image is a single piece of the whole experience. With such extensive side-shifting, Richards says the concern becomes a distortion of the images' edges in the form of softening. These softer edges would make it impossible to blend these separate images seamlessly and impact the overall immersion of the experience.

"The good thing is that each projector was precise and sharp in the same way," Richards says. "I would imagine there would be a degree of variation in a [lamp projector] - and that could even change over time. It would make it impossible to use the edges of the image because it wouldn't be precise enough."

Unlocking the potential with software

As valuable as the projection hardware was in making these images possible, Richards says the access to Panasonic's Geometry Manager Pro software freed the team up to utilize the projectors to their greatest potential. To get the images to line up perfectly, the team created a grid on the walls using 800 pieces of tape. Utilizing the projector management software, they were able to adjust the edges of the image wirelessly using a laptop to achieve the precision needed to create the effect of a single image.

"It was a 10-day process, and we brought in a professional projectionist who's a genius with this stuff," Richards says. "You start from one side of the room and match the image to the grid for each projector. Then, once you're done, you go back to the beginning and make all the minor adjustments you need to make until it's right, about four or five more times. Each time, It gets more precise."

The ability to make these changes and complete this process from the ground, using a laptop, was paramount to getting this job done within that 10-day timeframe, Richards says.

Low maintenance

The same aspects of laser projection that have led to improved blending and precision have also had a positive impact on maintenance cost and time, which Richards describes as "minimal." This is because of the lasting durability of laser projectors compared to lamp projectors.

Another benefit of choosing laser projectors over lamp based projectors is the low running cost of these projectors. Solid Shine laser projectors are cheaper to run, end of story. They require almost no maintenance, and with a variety of ECO features, use much less energy to operate continuously.

Providing a beautiful reprieve

When the Lighthouse Immersive team undertook this project, they had no idea what lay ahead in terms of coronavirus and the impact it would have on the entire world. Originally scheduled to open in May, the opening date had to be pushed back and the production time condensed to adhere to social distancing guidelines. Just before the opening, the group created a second location in the building, which transferred the exhibition to a drive-in art exhibition and allowed visitors to see the exhibit from the safety of their cars.

What they wound up offering was an opportunity to escape from these unprecedented times by getting lost inside the artwork of Van Gogh. Both the walk-in and drive-through experiences are sold out through their original run, and the reviews online have been largely positive.

"Was an excellent way to get my art fix during the pandemic," says one local guide, Anita, in her online review. "A terrific experience."