



A custom designed Nanolumens Rigid Nixel series display engages visitors at one of Intel's San Francisco locations. The 1.5mm Nixel has become the standard for high-end fine pixel pitch dvLED products.

Create Compelling Digital Experiences

The Digital Experience

Regardless of the environment—corporate, entertainment, gaming, sports, retail, education, house of worship, control room, hospitality, transportation or government—when it comes to incorporating a video wall into your space, you need to focus on the outcome you're trying to achieve: What your organization would like to happen during and after viewers are exposed to your content. Ultimately, the fundamental question is “why?” Why do you want a video wall, and why do you want the content it will display?

Fortunately, your video wall doesn't have to be a “wall” or a

traditional 16x9 screen. It doesn't even need to be flat. LED design and manufacturing company Nanolumens designs LED that are integrated into the architecture or structure in a space. They can be curved, circular, transparent mesh or almost any shape—or combination of shapes—that you can imagine. Start with your creative team, and let your minds run wild. Literally think beyond the traditional video wall. Imagine something that's one of a kind, that isn't limited by standard design norms or thinking that something can't be done. Nanolumens can collaborate with architects, interior designers

and systems integrators to custom engineer an LED display to make your ideas a reality. Just take a look at Nanolumens' Custom Engineering Gallery at www.nanolumens.com/custom-design.

Start Before You Start

“The two most important stakeholders that need to be engaging with each other as early as possible are your content team and direct view LED partner,” said Dan Rossborough, director of strategic projects, AEC-Special Projects Group (SPG) for Nanolumens. “This is a critical first step so you can match up your ideas

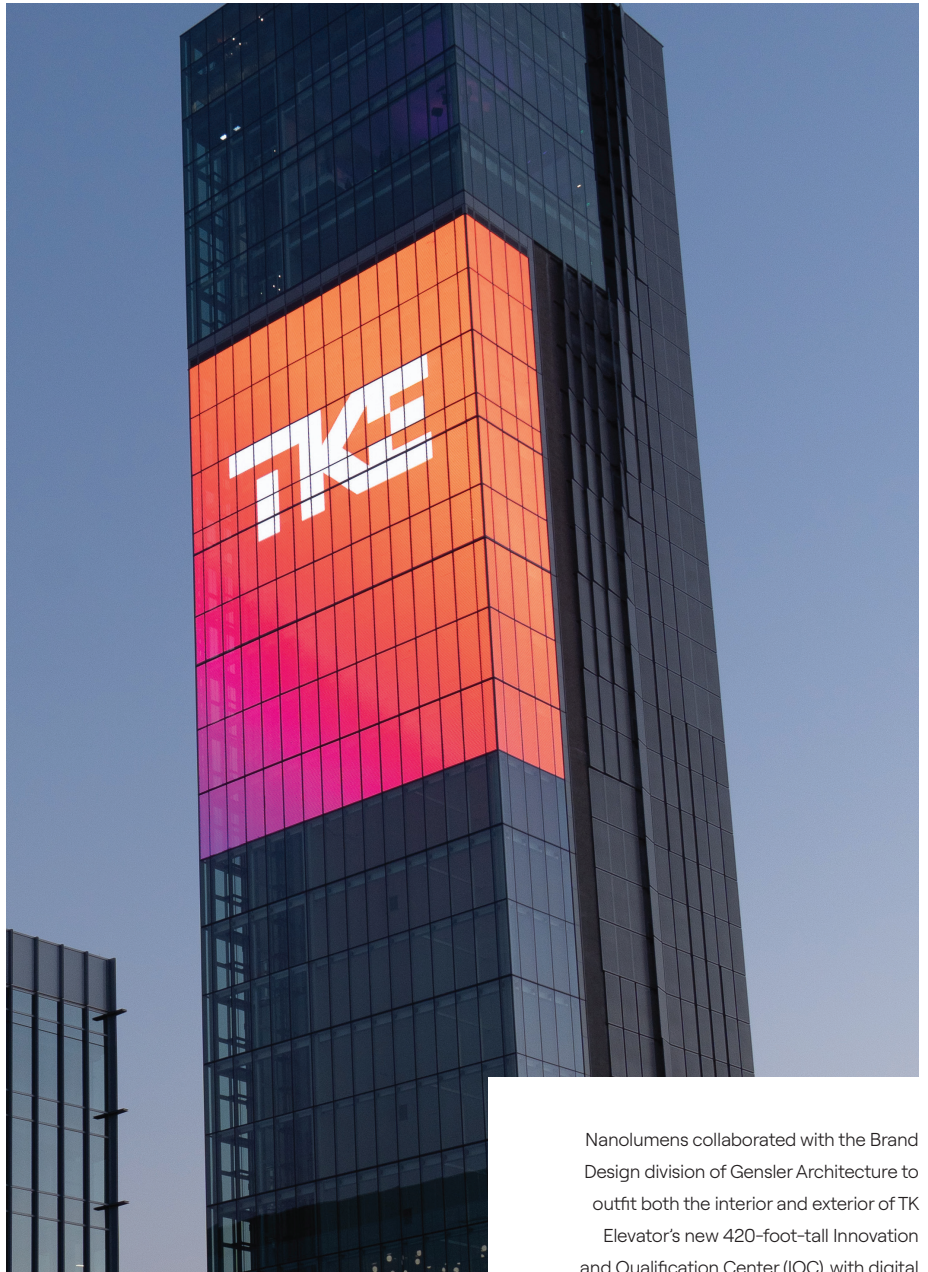
to have a clear vision of the outcome you're trying to create.”

As you interview and engage your architect, general contractor and systems integrator, let them know that you already have a concept and an LED display and design company that can execute your vision. Introduce them all to each other. One of Nanolumens' strengths is that they're well known to most partners, because they've worked with many of these firms in the past. That's a plus when your team already has a working relationship.

You'll also want input from your AV department that will have operational responsibility, as well as your IT department that will have to deal with the required display and control data. Involving both departments early is a good idea, as each will think of the project in different ways based on their own skillsets.

Once you have a concept, you'll probably want to get some idea of the costs involved. That comes down to three major categories: the cost to buy and implement the video wall, the facility impact of integrating the video wall and the ongoing maintenance and management of the video wall, including the changing of content.

If answering “why?” to the questions above is problematic or there's uncertainty within your team, this e-book can help. We'll dive into three elements—content, canvas and control—and what happens when they all come together.



Nanolumens collaborated with the Brand Design division of Gensler Architecture to outfit both the interior and exterior of TK Elevator's new 420-foot-tall Innovation and Qualification Center (IQC), with digital canvases befitting the tallest elevator test tower in North America. The Nanolumens digital canvas is the largest LED display on any building in the US. The project not only brought a prominent new fixture to the Atlanta skyline, it also brought about a new product line for Nanolumens. The SPG defined the degrees of freedom needed around the new CLRUVU LED Series and product development moved beyond tradition.

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Walk into the rotunda of the Ron Clark Academy in Atlanta, and the school mascots, the Blue Dragons fly overhead and land on the rim, looking down into the room.

Your Content Tells the Story

The content coming from your LED display has great power: It can not only inform, but also delight and engage. While each organization is different, so is where they are in developing their content strategy. There's an easy place to start if you get stuck.

"Simply summarize in 20 words what you want people to remember," advises Alexandre Simionescu, CEO and co-founder for Float4, an experience design and creative technology firm with offices in Montreal and New York.

"Twenty words is not that much, but the goal is to make people think about what they want to achieve. It's also very important that the people writing those 20 words realize that they are not the audience. Then we can sit down and flesh things out in the concept and design phase, where we also work out how often and how much the content will be changing over time."

As digital art, your content might be customized and created on a computer, it could be something real that's been recorded or it might be a combination of the two. Regardless, your content should bring a personalized experience to your audience. For Simionescu, these LED display spaces are the new frontiers of how digital and physical interact. Motion interactivity is one of the best ways to personalize the experience of each audience member.

"When we build a real-time interactive experience, we understand that there are different steps to that experience, which involve looking at the interactive design itself," said Simionescu. "We use different types of sensors and different types of interactive technologies, and we layer them together, so they're progressively used as people engage more deeply with the experience."

While Float4 always looks at

content creation that is technically feasible, most importantly, it must be contributing to the user experience.

A camera can pick up motion in front of the display, usually between six and 20 feet. That provides information on the x and y-axis (horizontal and vertical movement). According to Simionescu, at that point people tend to get closer to the display, and that's when the continuity of interaction breaks.

"A very simple example is what people will do when they see that there's interactivity. At some point they reach for the screen, and when they do, nothing happens because the interaction data comes from a sensor that's behind them."

To solve the z-axis (depth) problem, Float4 uses laser sensors that create a curtain in front of the display at a certain distance to ensure the continuity of interaction. In that way, a person reaching towards the screen sees an action associated with that movement.



The Canvas Makes It Tangible

The LED display is a canvas that must be an extension of the environment, enhancing the architecture and making it more dynamic. It can animate structures or be used as digital wallpaper that provides a seamless blend between the physical and digital worlds.

"We tell people, think of your LED display like a material," said Nanolumens' Rossborough. "Like wood, metal, bronze or concrete. Start thinking about shapes in your mind ... it doesn't have to be a rectangle."

That sentiment is echoed by Erika Kulbach, strategic partner manager for Electrosonic, a systems integrator in Los Angeles. "Even when it's a big video wall, clients could use that technology as a building material. Sometimes clients want it to disappear, sometimes they want it to be a unique canvas, a different shape, a different configuration. So, we try to dive into what story they're trying to tell from the very beginning, 'why a video wall?' and then we look at the various applications of technology

that can bring that story to life. For us, that's most often using Nanolumens and their incredible LED technology as the canvas for that story."

The questions Kulbach wants answers to are basic, but they require everyone on the team to be in sync. "Is it complimentary to a built environment? Is it going to enhance the feeling of a space by increasing the capacity of that space to tell a story because you have this kind of content and you have this canvas? Then we can look very early in the process with the partners you already have at how much it might cost and various options for bringing that thing

to life. Just being able to talk through that decision making process is priceless and can save a lot of money."

Perhaps the worst thing you can do from a design and cost perspective is change your mind mid-process.

"If you really want your display to be integrated into your architecture, it's best to make sure that you know what you want and have the right measurements and requirements," said Nanolumens' Rossborough.

"It's really hard to change your mind along the way saying, 'Oh, I'm not going to use this product, I'm going to use another product' because it might have completely different

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Multiple dvLED displays in the locker room of the Jack Trice Stadium complex at Iowa State University help attract new student-athletes.

requirements in terms of sizing, heat processing, access to maintain the tiles, etc. That could mean a lot of expensive sub work.”

According to Rossborough, a big shift happened probably four or five years ago where direct display technology specifically became ubiquitous in corporate, transportation and a few other environments. “That’s why Nanolumens conducts AIA-accredited courses for architects and designers. We help them to start thinking about AV technology as being a material that’s going into the building. There is a big leap from thinking about a durable material that’s going to last 30 to 50 years, to looking at something that’s going last six to 10 years. A lot of things became really important all of a sudden, like quality of components, longevity, warranty, among other things, because now the display is truly integrated and has to have symmetry with the architecture.”

Today, LED display technology can be a column, a wall that flows into a ceiling or almost anything,

according to Kulbach. “We have been advocating for designers to think about technology in a much more creative way, and to design it holistically into the environment so it is truly part of the meaning of the space. It’s important to understand the true experience of the guests within that space, the employees within that space, whoever is inhabiting that space or that place if it’s exterior, and think about it not as a static space, but something dynamic that can come to life.”

Kulbach explains, “One of the great things about Nanolumens is that they can implement the LED display as part of the architecture, because the technology is much more nuanced. Plus, it allows you to be so much more creative. Nanolumens most certainly has the products to be able to do that. As Dan and I have both said, it’s not just a rectangle.”

That’s exactly what Rossborough often deals with at Nanolumens. “There’s still a lot of old thinking out there about what an LED wall or display should be. When I talk with clients and the conversation starts to get more ‘traditional’ about design, I know I need to get them thinking about what’s possible today and to alleviate any concerns about how the physical building and the LEDs will interact. If there’s anything about LEDs that sticks out from the architecture, it’s literally an LED display sticking out from a wall. That’s why we have design services and experts at Nanolumens that can show you what’s possible. Tell us your LED dreams and we’ll tell you how to make them a reality.”

“They can implement the LED display as part of the architecture.”

– Erika Kulbach, strategic partner manager, Electrosonic.



The KAOS Nightclub at The Palms in Las Vegas is filled with dvLEDs, including custom automated concentric rings.

Control Puts You in Charge

Getting the LED displays and content up and running is not the last piece of the puzzle. A control system is a critical cog—even if you don't think you'll ever be making changes.

"We've talked with some project owners that have told us that they don't really need scheduling because it's just going to be the same thing every day," said Stephan Villet, owner of Smart Monkeys, a show control company based in Miami. "And bang, the very first day, they're like, 'oh, we have this special event, so we want to change that.' It's not that easy."

Show control provides a great deal of useful tools, not just a content management system that allows you to change content at will or manage your content in real time. It can provide for remote monitoring, self-healing technology to prevent problems before they occur, automated failover and fallback server control, and analytics to make data-driven decisions.

"There are all different types of data that run through the control system," said Villet. "You see that at airports with arrival, departure and baggage

information, restaurants, at currency exchange companies and for general advertising. They all have their own identity that usually translates into the shapes and forms used to integrate them into their environment. It's not just having something great on the wall; you need to operate the space."

Another benefit of a show control system is analytics. Not about what's happening now, during a snapshot in time, but trends. Trends that help you to understand if your LED displays are doing what you intend for them to do: are they meeting KPIs or other expectations?

"Trends are something that results from having a lot of data that you can look at," said Villet. "A trend is not something that you set on finding from the beginning. We're at a point where gathering information, storing information and searching through that information doesn't require a huge budget. The problem is if you don't collect the data, you will never find any trends."

But what data should you be collecting? According to Villet, everything you can think of.

"If after a few months you realize

you don't need a dataset, you can scrap it, but it's better to keep on getting it because that's the only way you will find trends, because you don't know where it will be until you find it," said Villet. "There might be some data that you feel at first are completely useless, and then you see them and you're like, 'oh, actually over time, it gives me a much better understanding of why people are more excited about this piece running at night than when it plays at other times.'"

You also want the show control system to be connected to as many systems as possible because having a show control system could bring about interesting ideas, like controlling LEDs and lighting that were not part of the original LED display plan.

"What we're concentrating on is looking at all this and saying to the client, 'well, you have all those systems, why don't we make sure we're connected to those systems? If you never have to use that connection, it's fine. But if one day you do, and have it already, it's much easier than connecting to those



Bringing it All Together: Content, Canvas and Control

When you work with a trusted adviser like Nanolumens that understands the relationship of content, canvas and control, and the relationships among architects, general contractors, system integrators, creative designers, control companies and other team partners, you come away with a design consultation that addresses all the areas this e-book has touched upon, as well as mitigating risk for the long term.

It will be up to your systems integrator to leverage the platforms and technologies that incorporate all three elements for a successful

system that meets the answer to that initial question of why you wanted an LED display in the first place.

Finally, you'll want ongoing support to maintain and update the experience. From a maintenance and support standpoint, that could be your systems integrator. From a content standpoint, that might be a content creator on staff or a freelancer.

Create Compelling Experiences

When you combine powerful LED display content, a dynamic canvas and intelligent control, you unlock the ability to create captivating experiences that engage, provoke and inspire.

A unique dvLED installation displays flight information at Toronto's Pearson International Airport.

For more information, visit www.nanolumens.com