

Considerations in Deploying an LED Display

LED displays are quickly gaining market share, but it's important to know the pros and cons.

LED displays have predominantly been used for applications such as outdoor billboards while LCD displays have dominated the indoor display market. However, recent improvements in LED technology are opening the door to an increasing number of uses that may have once been the domain of a LCD screen.

And that's being seen in the growth in sales of LED displays. The size of the global market for LED displays is expected to reach \$12.5 billion by 2020, according to Albany, New York based Transparency Market Research, up from \$4.8 billion in 2013. That's a compound annual growth rate of 14.7 percent.

Other forecasts are even more optimistic. Englewood, Colorado-based research firm IHS Markit Inc. predicts unit shipments in the direct-view LED video will increase at a compound annual growth rate of 16 percent from 2016 through 2020.



"The top applications for LED video are retail, outdoor sports and public spaces," said Sanju Khatri, director of digital signage and professional displays for IHS Technology. "There is a growing trend in indoor applications, particularly in public spaces, retail, control room and corporate signage."

Still, there are advantages and disadvantages when it comes to weighing the use of an LED display compared with an LCD screen. So when considering an investment in a digital signage deployment, it's important to know what those factors are and which type of display works best in a particular situation.

Defining the difference

Before delving into the reasons why an LED display might be an appropriate choice for a digital signage deployment, it's worth mentioning the difference between those displays and their LCD brethren.

LCD flat-panel displays use the light modulating properties of liquid crystals to create millions of pixels, which can be switched on or off very rapidly to make an image. The liquid crystals do not emit light directly, but use some method of backlighting for illumination.

LED displays, on the other hand, incorporate an array of LED lights in individual modules, with each light serving as the equivalent of a pixel cell in a LCD screen.

Those types of displays, which have their roots in the time and temperature displays once common on signs in front of banks and drugstores, typically have featured a much lower resolution than LCD displays. But because they were typically viewed from a much greater distance than a LCD display, the resolution wasn't as critical.

As technology has improved, the distance between individual LEDs – known as pixel pitch – has become smaller, resulting in resolution approaching that of an LCD display and opening up opportunities for new and unusual deployments.



Objectives, applications and audience

When deciding if an LED display is the right choice for a digital signage solution, deployers need to consider several key questions.

Some of the first, and most obvious questions, are where will the sign be placed and what does the deployer hope to accomplish?

“More specifically, what is the viewing distance and how is the audience looking at the sign?” said Grant Wylie, senior product manager, LED Signage Solutions, at Chicago based NEC Display Solutions. “Are they stationary, are they moving? What are you trying to communicate?”

Although the resolution of LED displays is approaching that of LCD screens, images on a LED display can appear grainy when viewed up close. On the other hand, LED displays offer a much wider viewing angle than a LCD display, meaning they can capture a much wider audience. In addition, the content on an LED display is much brighter than that on an LCD. So while an LCD display may be the better choice for an eye-level application where viewers might be just a foot or two away from the screen, an LED display might be a better choice when the display will be mounted above the viewers' heads and several feet away, or in a situation where there is high ambient light.

An example might be signage in an airport or train station displaying arrival or departure information, or an advertising screen mounted high up on the wall. In addition, LED displays can be installed outdoors without any extra protection, making the obvious choice for a display mounted on the side of a building. The screens are waterproof, dustproof and bright enough to be seen in direct sunlight.

And while LCD displays are generally constrained to the standard 16:9 aspect ratio, the modular design of LED displays mean they can be manufactured in any shape or size desired.

“We see a lot of unusual sizes because of the modularity of the display,” Wylie said. “You can make your configuration just about anything you want. The challenge that comes after that, is creating content customized to match the sign.”

Serviceability and durability

In many cases digital signage is used to display advertising, meaning that a person or a company is paying to have their message shown on that screen. Because of that, keeping the screen operational is critical to the success of a deployment.

Sooner or later, nearly every piece of technology is going to run into a problem. When choosing a display, the quality of the components used in the display and the serviceability of the screen are factors that need to be considered.

In the case of LCD signage, recovering from a failure is typically a matter of replacing the failed screen with a new one. That's not always the case for an LED display.

“Most LED displays are very large items, and you really can't take the whole thing down to work on the screen,” Wylie said. “It's important to keep in mind whether the system incorporates redundancy on internal components, so that if something goes down the display stays running. There are some that do and some that don't.”

It's also important to be clear on what the warranty of the unit covers and what it doesn't. If a problem with the screen is caused by a defective component, what costs will the deployer be responsible for and what will be covered by the manufacturer? More importantly, will the manufacturer still be in business if and when a problem arises?

And if the screen does ultimately require a visit from a service technician, how difficult will it be to perform that work?

And although the modular aspect of LED screen design means that in many cases a repair will simply involve switching out one of the modules, that's not the end of the story.



“LEDs are matched together when manufactured so they are in the same color spectrum and brightness level,” Wylie said.

“Two years down the road, if you have to change out some of the LEDs, it’s going to look different,” he said. “So either the screen has to be recalibrated or you need to put in another module that incorporates matched LEDs that were manufactured at the same time as the original ones. Knowing this is a possible outcome, it’s important that either the vendor or you will have spare parts available from the original production of the sign or the ability to simply recalibrate the color and brightness of the display.”

The bottom line

Ultimately, one of the main factors that will go into the choice between an LED and an LCD display is the cost. It’s no secret that LED displays are more expensive than LCD displays, though prices have been dropping.

Still, there are other considerations to take into account besides a simple cost comparison.

“One of the key things you are trying to do with a sign is draw someone’s attention to the sign and retain their interest,” Wylie said.

“LED has that ability,” he said. “The high brightness aspect of an LED display allows a content creator to develop content that will draw someone’s eye and keep their interest. So yes, LED costs more but it offers the ability to charge more for advertising.”

Another factor to consider when evaluating value is longevity. While an LCD display is going to last between 35,000-50,000 hours, an LED display is going to range between 80,000 and 100,000 hours. In addition, LED displays typically use less power than their LCD counterparts, resulting in lower operating costs.



And most importantly, what is the reputation of the vendor selling the display? Is it a reliable supplier?

“One of the things that we are seeing is a significant number of fly-by-night companies that are coming in and are willing to sell whatever product they can,” Wylie said. “But in a year or two when you need service or spare parts, is that company still going to be around?”

Ultimately before choosing to deploy LED signage, it is important to keep these key considerations in mind to ensure a successful, future-proof solution.



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