

WHITE PAPER: THE EVOLUTION OF DIGITAL SIGNAGE

How Advances in Visual Display Technology Are Benefiting a Wide Range of Industries



INTRODUCTION: THE POWER OF VISUAL DISPLAY

In a visual age digital signage has become a key way to engage, inform and entertain in nearly every place people congregate, from lobbies and schools, to grocery stores and cruise ships, to doctor's waiting areas and corporate meeting rooms.

The global market for digital signage — which includes the displays, media players, software and installation/maintenance costs — is exploding. It will expand from \$1.3 billion in 2010 to almost \$4.5 billion in 2016, according to *Digital Signage: A Path to Customer Loyalty, Brand Awareness and Marketing Performance*, a 2010 survey by Aberdeen Research.

The reason for the rapid growth is clear — digital signage gives organizations the ability to send targeted messages to the precise place at the precise moment that people want the information. In the *Signage & Professional Displays Market Tracker Report*, an April 2012 survey by technology market intelligence firm iSuppli, adults said that digital signage catches their eye even more than billboards, magazines, TV, the Internet or radio. And the majority of people declared that digital signage was more unique and interesting than those other types of media.

The popularity of digital signage is growing in tandem with technology improvements, which are resulting in displays that are more functional and flexible and provide crisper images. And these improvements are coming as the cost of the devices drops. This paper will look at the advances in digital signage, as well as innovative ways in which different industries are deploying it to stand out from competitors, drive sales and satisfy customers.

INNOVATIONS DRIVE DOWN COSTS

Mitchell Auerbach, vice president of operations/director of LCD solutions at Edge Electronics, an electronic components distributor that makes visual display solutions, explains that the first generation of digital signage was flawed, in that the solutions often used non-commercial-grade television sets connected to DVR players.

“People couldn’t understand why the solutions were breaking down every three to five months, but it wasn’t designed for commercial purposes,” he says. “The new technology is developed with digital signage in mind, and also media players, which are ruggedized DVRs. So the whole display is meant to run constantly for a much longer period of time.”

Next-generation displays

In addition to these improvements, Auerbach says there is a significant movement to drive down the costs of visual displays. For example, the original visual displays used cold cathode fluorescent lamps (CCFLs) for backlighting. Backlighting refers to the light that comes from the rear of the device to illuminate the image. The CCFL method is cheap but does not use power efficiently. And power usage is the most expensive and often overlooked element in the long-term costs of visual displays. CCFLs are also bulky, because the units house both lamps and a reflector, which limits where and how visual displays with CCFLs can be used.



The new generation of visual displays incorporates light-emitting diodes (LEDs) backlit technology, which operates under a different principle than incandescent light bulbs. A light bulb heats tungsten filaments until they glow, in a similar way to how the heating element in a toaster works. LEDs, in contrast, have no filament that will eventually burn out, and LED-lit panels don't get particularly hot. They are illuminated when electrons move in semiconductor material. LEDs have all sorts of applications — they form the numbers on digital clocks, alert you when appliances are turned on and, when collected together, form the image on jumbo television screens. The LEDs provide the illumination for the liquid crystal display (LCD), which is the flat panel or video display that shows the image.

A MORE EFFICIENT LIGHT SOURCE

As a much more efficient light source, LEDs produce significantly more light per watt than a traditional light bulb. Because of this, these new displays deliver uniform brightness levels, while using only 30 to 50 percent as much power as CCFLs. “The new technology with LED-backlit is huge,” Auerbach says. “The displays are using less and less power.” This lowers costs and also reduces the amount of carbon emissions.

At the same time, these technology advances allow smoother scrolling text and reduced motion blur in digital signage messaging, which are increasingly important considerations, as visual displays are being deployed for ever more critical purposes, to drive sales and engage customers. The result is a higher contrast ratio, which creates a better picture along with the energy savings. With native contrast ratios of up to 5,000:1, the new generation of LED/LCD displays produces more realistic images, which heightens their impact.

Quality meshes with size

This improvement in quality is growing in tandem with the size of the displays. According to the iSuppli survey, the 40- to 44-inch and the 45- to 49-inch displays were dominant in 2011, but within four years that will shift toward even larger sizes, including the 50- to 59-inch group of displays. Smaller sizes, such as the 25- to 29-inch and the 30- to 34-inch, are expected to lose traction as larger-sized displays become more affordable.

“For smaller screens, like a three-and-a-half-inch screen near a supermarket cash register that is promoting an impulse buy, we are seeing more concern about price than quality,” Auerbach says. “For the larger screens at airports and restaurants, we are finding a much higher demand for quality.” He believes this will intensify if the federal government requires digital signs in large public areas to meet the standards of the Americans with Disabilities Act. (The Act's regulations limit the distance digital signage can protrude from a wall, making the thickness of a display an important consideration and further increasing the appeal of slim LED-backlit panels.)

The iSuppli survey identified other key advances that are driving the growth of digital signage: super-narrow bezel video walls, interactive touch screens, and high-brightness outdoor display. These developments are providing visual display solutions that not only offer superior image quality but also the flexibility to work in almost any environment and manner in which they are needed.

INNOVATION AND ROI

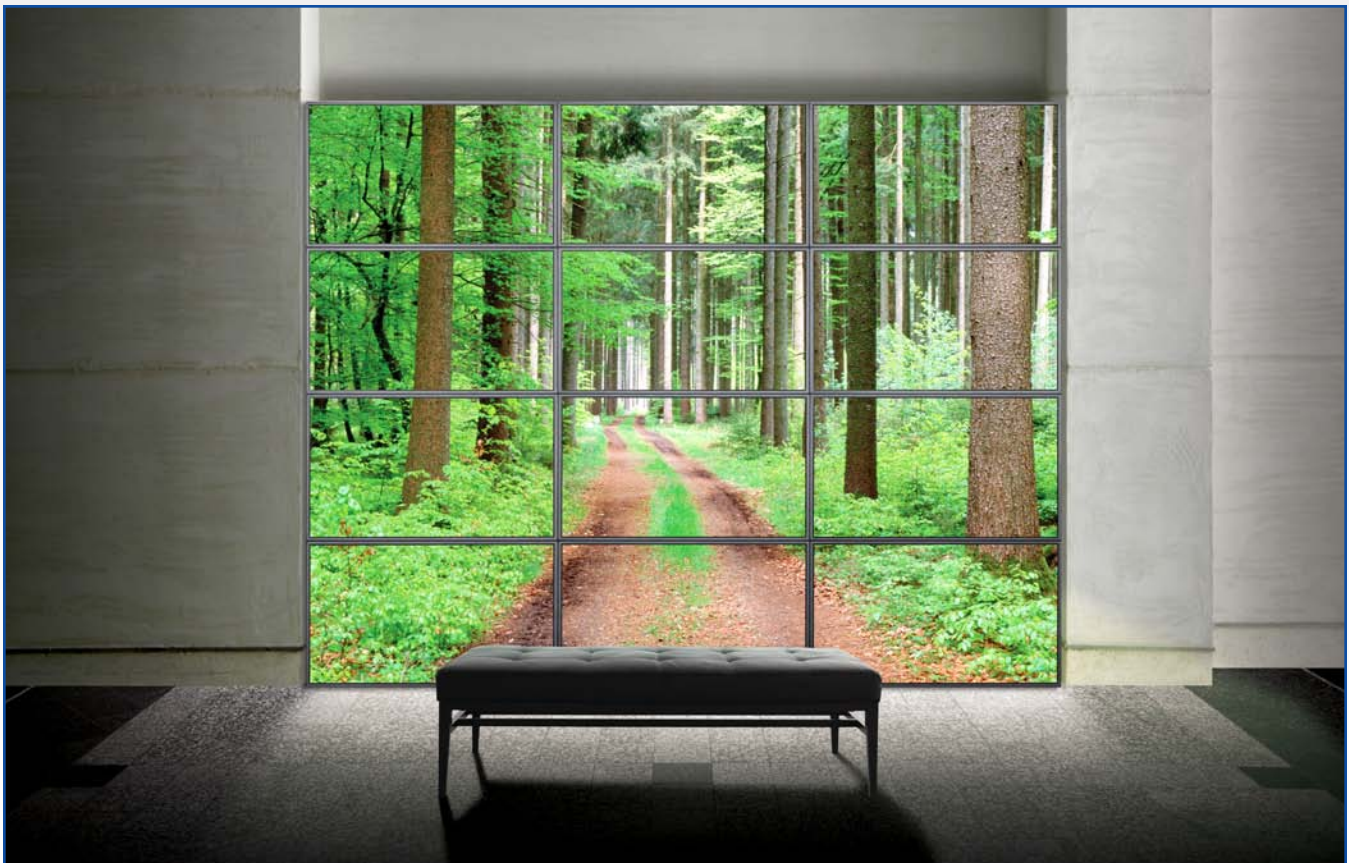
Auerbach notes that many businesses are expanding the way they use digital signage. “Some airports now have hundreds of 55-inch monitors, and they’re not just using them to show information about arrivals and departures,” he says. In London’s Heathrow Airport, for example, video monitors along the wall at one of the escalators showcase art. “It just shows you the kind of impact you can have with digital signage — it can be used in very modern ways as a design choice.”

And they’re using the signage to improve their ROI. For example, Las Vegas’s McCarran International Airport recently showcased a 100-screen video wall at the airport’s D Concourse rotunda. The ultra-thin bezel around each monitor gives the appearance that the tiled formation is one solid piece. The giant display, which measures 33 feet by 19 feet, is believed to be the largest-known video wall in a U.S. airport.

“McCarran is one of the most technologically driven airports in the aviation industry,” said director of aviation Randall Walker. “We’re at it again with this landmark digital video wall. Its eye-catching stature allows the airport and advertisers to speak to travelers from all corners of the world and also presents a unique opportunity to increase revenue.”

It has been estimated that the video walls will produce an additional \$500,000 to \$1 million in gross advertising revenue for the airport each year.

Let’s consider some of the innovative ways that companies are using visual display stations for public displays, commercial displays and corporate displays.



PUBLIC DISPLAYS

Museums, libraries, churches and lobby receptions are turning to digital signage to provide up-to-date information in an efficient and entertaining way.

Hotel operators, for example, are using visual displays as a “digital concierge” for guests, helping them find their way through the property, see menus for on-property restaurants, learn about the weather or flight delays or keep informed about events.

As the technology improves, hotels and other establishments are finding ever more creative ways to use the displays. For example, at one Las Vegas hotel, chefs prepare appetizers, entrées and desserts in a series of live cooking demonstrations, which are then broadcast on a large display to entertain and educate guests.



Signage as a focal point

One swank new hotel on the Las Vegas Strip has made the public displays in its lobby a signature attraction. The design uses 24 screens on the wall behind the front desk. Another 400 ultra-thin bezel screens wrap around eight four-sided columns. The ultra-thin bezel can be a third or more lighter than traditional CCFL-backlit displays, making them easier to install. The lighter weight also eliminates the need for companies to get their walls reinforced in order to sustain the weight of the screen making it possible to place screens in more locations than was previously possible.

The impressive column displays at the hotel are behind sheets of protective mirrored glass, adding not only a visual element but an easily accessible maintenance portal. Guests roaming through the lobby are taken aback by the mesmerizing images that rotate on the many screens, from simple geometric shapes to brilliant underwater landscapes and pristine snow falling in a forest.

COMMERCIAL DISPLAYS

Supermarkets, small food and beverage restaurants, real estate shops and food courts are all using digital signage to generate sales and spur impulse purchases.

According to *Localize to Optimize Sales Channel Effectiveness*, an October 2011 study from the CMO Council, interactive digital signage has become one of the preferred channels for localized marketing. The reason is obvious — since visual displays are a “place-based” medium, the signs and messages can be easily tied to their target audience. A sporting goods store has a clear idea of what kind of information visitors want; a restaurant knows that anyone who comes through the door has food on his mind.

Retailers have found innovative ways to integrate visual displays with other emerging technology, such as social media and crowd sourcing, which is the process of turning to an entire customer base to create new products and services. For instance, 4food, a New York City eatery, invites customers to create and name their customized burgers and then earn a royalty when other people order their creation. The restaurant attracts attention with a visual display that contains the “BuildBoard Chart” of the top-10 ordered burgers created by customers and the “Trending Burgers” table of most recently purchased and branded burger creations.



The next evolution of digital signs will use predictive analytics, which is technology that can identify data patterns that will drive sales and instantly put a message on a digital sign in response to changing conditions. For example, a restaurant that finds itself overstocked on some foods could reduce spoilage by reducing the price on those items, or a retailer could push umbrellas by announcing on its sign that rain is forecasted for the following day.

Video display ROI

These are just some examples of how technology advances are being leveraged to boost the return on investment (ROI) of visual displays. In a retail environment, customers are starting to use their smart phones to interact with digital signs to get coupons, product information or product reviews.

“Digital signs allow you to talk directly to the wallets that are passing by every day,” says Steve Harriott, president and CEO of Watchfire Signs, a company that makes LED digital signs for industries ranging from car washes to banks and funeral homes.

He says the ability of visual displays to provide immediate information is causing companies to shift some of their marketing budgets to them. An auto dealer, for example, can change the messages on its screen, minute by minute, as its inventory changes. In contrast, a car featured in a newspaper ad might be sold by the time the ad runs. “The growth in digital signs is being paired with what’s happening in the broader world, where people want to communicate everything instantly.”

CORPORATE DISPLAYS

Hotel/leisure centers, seminar/meeting rooms, cruise ships and financial exchanges are some of the industries that have embraced digital signage as a more effective way to keep customers and workers up to date.

Advancements in such areas as video-display resolution and the arrival of large-format displays, such as LCD, have enhanced the effectiveness of video walls and are expanding the scope of experiences offered on video walls. Auerbach says, “It’s amazing how fast companies are adopting the 55-inch monitor with the super-thin bezels for use in the video walls of their conference rooms.” He worked with one international company that combined eight separate 55-inch panels for this purpose.

Sources for continuous information streams

Royal Caribbean implemented a digital signage system throughout its fleet, including in the world’s largest cruise ship, Oasis of the Seas. Stood on its end, this huge vessel would be nearly as tall as the Empire State Building. Some 150 LCD screens were located throughout major passenger-traffic areas of the ship, providing continuous messages about guest services, sailing events, production show times and shore excursion activities. The interactive display system is composed of three dozen 46-inch LED screens, as well as eight horizontal screens, which were installed at specific points throughout the ship.

The dining room display provides passengers with a list of the on-ship eating places, their locations and an indication of how long it will take to be seated at that particular dining space. The graphic on the screen resembles a thermometer, which is color coded by red, yellow or green to provide a distinct idea of the wait time.

Even the Port Everglades, Florida terminal that was built to dock the mammoth Oasis of the Seas is outfitted with 192 LCD LFD displays, running Samsung's software to provide passenger embarkation and debarkation instructions.

Royal Caribbean was so happy with the interactive screen results that then became a strategic competing feature in how it marketed its cruise line offerings. "As for the passengers, they just love it," according to Heath Burr, a program manager on the Royal Caribbean project. "It was the number-one rated ship feature with the highest number of positive feedback comments."

Clearly the uses of visual displays are growing in tandem with their impact. One reason, of course, is the dropping cost of the technology, which puts digital signage in the price range of virtually any type of business. Another reason for the explosion of digital signage is the advances in technology that make its application appropriate for so many uses, ultimately satisfying the varied needs of customers in an increasingly wide range of venues. Digital signage allows unparalleled opportunities for creativity and innovation while it informs and entertains. As our communications become ever-more visual, this technology will continue to expand and become a competitive advantage for many companies and a business imperative for others.

ENABLING INNOVATION IN DIGITAL SIGNAGE

"Samsung is leading the commercial digital signage industry's transition to LED technology," asserts Tod Pike, senior vice president at Samsung's Enterprise Business Division. "We were the first to introduce LED-backlit LCD models specifically designed for commercial display and we continue to expand our offering while being the leading provider for system integrators. Samsung is committed to providing solutions that enable all businesses to benefit from LED-backlit displays, as nearly half of our product lineup is now LED."

Samsung's lineup offers digital signage solutions to fit a range of budgetary and creative needs. In the case of the former, while LED LCD technology is gradually becoming the standard for commercial displays, cost has been an issue. [Samsung's MD Series Commercial LED LCD displays](#) are poised to change that paradigm, making it possible for any business to enjoy the benefits of LED backlit technology, with an acquisition price comparable to CCFL-backlit displays. Easy to transport and install, the lightweight MD Series delivers energy savings, a range of sleek sizes, ease of use and much more. Features include:

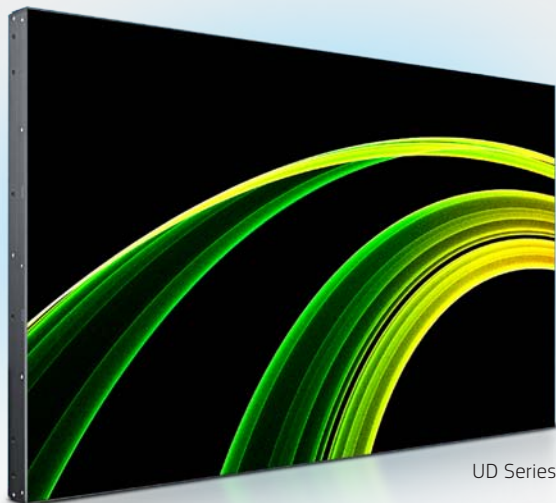
- **Direct-Lit LED Technology:** Direct-Lit LED technology provides the brilliance and energy savings of LED technology while also providing the uniform brightness typical of CCFL displays. Users can upgrade to LED technology for a cost comparable to CCFL technology.



MD Series

- **High-Resolution Screen:** MD Series displays feature 1,920 x 1,080 resolution with 350 nits brightness and 5,000:1 contrast ratio for sharp, detail-rich images and crisp, easily legible type.
- **Narrow Bezel:** MD Series displays feature narrow bezels of just 17.5mm/.68 inches with a bottom bezel of 21.5mm/.84 inches (MD32: 16.5mm/.64 inches with a bottom bezel of 20.5mm/.80 inches). Narrow bezels provide a sleek, sophisticated look while providing maximum viewing area.
- **Embedded Media Player with MagicInfo Lite:** The MD Series offers an embedded media player (USB Plug and Play with MagicInfo Lite software). Users can play media without an additional player, and can easily display or schedule video clips, slide shows and image files.
- **Energy Savings:** The Samsung MD Series Direct-Lit LED displays deliver a lower TCO, with up to 50 percent lower power consumption than traditional CCFL technology.

In terms of spurring creativity regarding the installation of video walls, Samsung's new UD22B is a 22-inch, square type display featuring a one-to-one format and a super-narrow bezel that helps companies that are looking for a unique display solution that allows them to build creative and artistic installations. With the ability to daisy chain up to 100 units and a 1.8 mm/0.07-inch bezel that allows for seamless tiling, the UD22B provides endless flexibility for installations that are only limited by the imagination of the user.



UD Series

For installations that need to run 24/7, [Samsung's DE Series](#) offers the necessary commercial reliability, with 600 nits brightness and antiglare technology that renders a clear message, day and night.

Samsung offers a commercial display solution for nearly any use. Choose from LED-backlit displays, touchscreen displays, video wall displays, outdoor displays and more. [Learn more about all of Samsung's signage solutions.](#)

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