

Reality Tech

A new arsenal of display technologies brings real-world possibility to dynamic environments.

BY JEFF GRANTZ

Your new client walks into the dimly lit conference room still wearing his sunglasses and sporting a European man-bag carrying what appears to be... no it can't be, a Chihuahua? Before introductions have been made, he leads off the meeting by saying, "I want the newest, brightest, highest resolution, most compelling, cutting-edge media installation ever designed. I don't want to lose my shirt on this, so the technology needs to have been installed dozens of times before, come from a reputable manufacturer, and cost less than a million dollars. And by the way, we're going for LEED Platinum on the building, so it's got to be green."

At this point you have two options: turn and run, or count to 10 and remind yourself that this is just the first stage of any "real-world" design process.

The good news is that an ever-expanding arsenal of new technologies pulls these lofty aspirations down from the clouds and into the realm of possibility. The newest crop of technologies includes three display solutions that offer unique approaches, performance criteria, and applications. We're not comparing them apples-to-apples, but instead offering up a fruit basket of new options to consider for your next dynamic installation.



Below: The soon-to-be-released Christie Digital display system offers the highest resolution digital display suitable for large-scale applications, with minimal seams between tiles. High brightness and pixel pitch make it suitable for most interior applications and minimal viewing distances. (Image ©2009 Sensory Interactive)

Right: Within a high-end, mixed-used retail development underway near Incheon Airport in Korea, Christie Digital's new high-resolution digital display is being proposed for an interactive installation. The wall uses RFID technology to recognize users and present animated content responding to their movements. (Project: Cloud 9, Incheon Airport Development, Korea. Image ©2009 Sensory Interactive)



Magink is a reflective display technology that supports full-color video, is scalable for architectural applications and, unlike other electronic displays, it actually benefits from ambient light. It uses no embedded light source,

so energy consumption is about 70% less than LED displays of comparable resolution. (Project: Patriot Place, Foxboro, Mass. Design: Cambridge Seven Associates. Photo: ©Robert Benson.)



Before all the “tech talk”

Your biggest challenge with any media installation is to create a constructive roadmap that guides your client in exploring ways to integrate digital media into their project. Although it may seem counterintuitive, we always find it best to assume that there is a technology out there to accommodate your intent. Of course, as with any design process, there will be compromises and adaptations along the way. In the end, however, your project will be best served by defining the basic performance criteria and objectives *before* choosing a technology or display system.

Performance criteria should be linked to your design mission statement and should clarify:

- Purpose of the installation
- Primary audience
- Viewing locations
- Intended content
- Hours of operation
- Conceptual design
- Potential for interactivity
- Placement
- Possible architectural integration

Defining these criteria is probably the most critical phase, and also the one that is most commonly skipped. Without this step, you may find yourself tens of thousands of dollars down the wrong path, having never really articulated what the purpose of it all was in the first place.

Once your performance criteria are established, you can define the general specifications of technologies required to support these criteria, such as resolution (high/med/low), vertical/horizontal viewing angles, contrast, brightness, content delivery system, budgetary constraints, and power consumption. Note that we have yet to even mention any products or manufacturers. Now, having clearly defined the concept and purpose of the installation and the general performance specifications that need to be met (budget included), we can begin to evaluate some possible technologies.

An LED alternative

Now in its third generation, reflective display technology supports full-color video content, is scalable for architectural applications, and is suitable for both interior and exterior installations. Reflective displays are available at a price point (per square foot) slightly less than LED video displays with comparable resolution. The most prominent advantage to this technology is that it actually benefits from ambient light as opposed to working against it. Simply put, the brighter the direct light on it, the brighter and more vibrant the reflected digital image becomes.

A reflective digital display is comprised of three layers of cellulose-based liquid crystal captured between two sheets of glass. Since no embedded light source is required to illuminate the image area, its energy consumption is nearly 70 percent less than LED video displays of comparable resolution and brightness levels. This advantage makes reflective displays ideal for projects seeking LEED accreditation. It's important to mention that comparisons of image resolution are not really apples-to-apples due to the fact that LED resolution is based on the average distance (on center) between LED pixels. The distance between the pixels is usually blank space, so the closer you stand to the display, the easier it is to distinguish individual points of light. With a reflective display, there are no gaps between pixels. Instead, a display tile is made up of solid 9mm color squares that fully cover the 6-in. tile area. These individual tiles are magnetically fastened to a larger 20-in.-square frame that holds a total of nine tiles and can be attached to a wall or substructure, allowing the tiles to be front-serviceable.

There are visible seams to be considered when designing with a reflective display, although if you combine the gap between tiles with the thin grey perimeters around each, there is only a ¼-in. visible seam every 6 inches. This could be negligible from greater viewing distances and would depend on the overall size of the display.

Another unique characteristic of this solution is that the content on the display can be altered using color-changing fixtures. With this capability, it's possible to activate otherwise static images in situations where video content might not be permitted due to zoning restrictions.

A breakthrough interior display

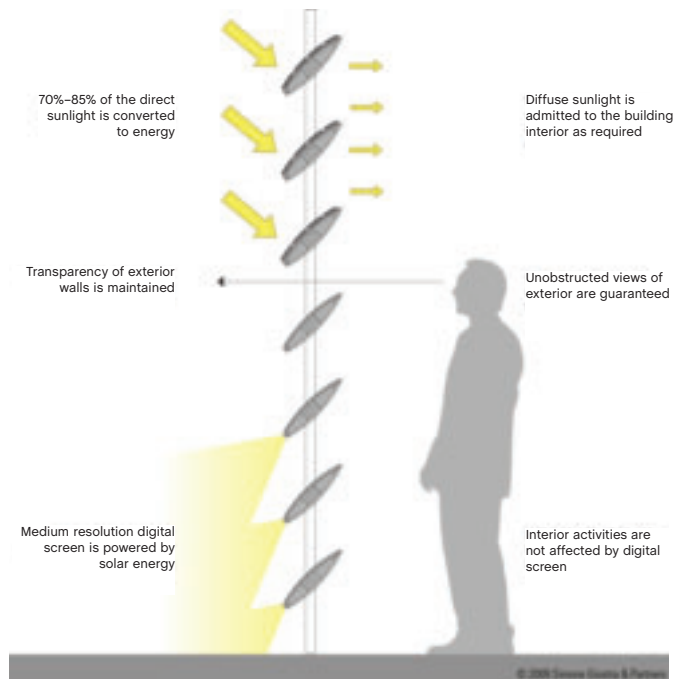
One of the latest display products, yet to be released to market, is a new advanced media display system that may very well set a new standard for evaluating interior full-motion video display systems. When we viewed a demonstration of this product in New York City in April 2009, everyone in the room full of architects and designers all seemed to say the same thing: “Finally!”

This new technology will provide the highest resolution of any video display product suitable for large-scale architectural applications. Due

Far right: SolPix is an architecturally scaled system combining sun shading, photovoltaics, and LED display. It reduces heat gain, harvests solar power, and powers a transparent media wall. (Image ©2009 Simone Giostra and Partners)



Right: SolPix is the next-generation version of architect Simone Giostra's GreenPix Zero Energy Media Wall, installed on a Beijing entertainment center in time for the 2008 Olympic Games. (Image ©2009 Simone Giostra and Partners)



to its high brightness and fine pixel pitch, it is ideal for most interior applications and for scenarios requiring minimal viewing distances. Although the core technology is still under wraps, we can share with you that it's a "breakthrough" evolution of a proven robust display solution. Designed as a stackable display module, it can be oriented in any direction, leaving a minimal seam between tiles. Given that it delivers high resolution to support face-to-face viewing and emits very little heat, it is also a great solution for those applications calling for interactivity.

Like some other currently available technologies, this display can support interactive content without the user actually touching the surface. As with other displays of its type, though, incorporating a protective glass overlay is still recommended in certain situations.

Another important attribute we found was that in addition to an already impressive lifespan, this front-serviceable technology is comprised of only a handful of changeable parts that can be replaced in a matter of minutes, allowing for indefinite operation. This is in stark contrast with LCD displays, which may appear to have comparable lifespans, but are ultimately destined for a landfill.

Finally, as the product is virtually lead- and mercury-free, and is comprised of over 85% recyclable materials, it is perhaps the most environmentally friendly choice of any display product currently on the market.

Green and clean

There are now display systems capable of fulfilling the lofty aspiration to provide a visually compelling, digitally controlled display that is, for lack of a better word, "green." One example we recently reviewed for a project is best described as a cleverly-engineered assemblage of three tried-and-true architectural technologies: sunshades, photovoltaics, and exterior color LED strips. This combination results in a low-resolution display solution capable of supporting full-motion video content for applications with longer viewing distances, while offsetting more than half the energy required to power the display. This is, of course, dependent on the type of content being displayed and the duration of playtime.

Environmentally friendly solutions such as these have enormous potential because they offer significant cost and energy savings for building owners far beyond the energy gathered by the photovoltaics alone. Taking into consideration the indirect benefits of the sunshade structure and its contribution to improving a building's overall energy performance, in addition to state and federal tax incentives for employing sustainable technologies, this is a display solution that, under the right circumstances, could literally pay for itself. It is well suited for large installations such as sports arenas and building curtainwalls and, if the content works within the limitations of the resolution, this system can provide a very cost- (and energy-) effective platform for supporting semi-transparent animated media content.

A digital media masterpiece

Now that we've outlined a few of the newest display technologies available, let's fast-forward six weeks to the big presentation day with our ambitious client.

You have now clearly defined performance criteria, and you know the type and purpose of content you'll be displaying, as well as the resolution and brightness needed to support the content. You've identified two to three technology approaches that could deliver the design intent (ranging in cost and capability).

So now your client walks into the room with his snippy Chihuahua and sits at the table across from you. You step to one side of your presentation board, finding it hard not to grin knowing that you're just about to unveil an iconic media centerpiece so inspiring it will likely make viewers reevaluate their purpose in life and ensure eternal peace and prosperity within a 10-mile radius of the installation. Before you have a chance to even flip your first board, the owner leans across the table and says, "What do you guys think of adding a dynamic water feature?" X

Jeff Grantz, director of project development with Sensory Interactive, helps clients plan, design, and implement dynamic media platforms that engage, inform, and entertain guests within the built environment. He is a graduate and adjunct faculty member of the Rhode Island School of Design. You can contact him at jgrantz@sensoryinteractive.net.