

Walking the Technology Talk

At Liberty Science Center, visitors use technology and new media to interact with—and even change—museum content. BY PAT MATSON KNAPP



Above: The Liberty Science Center, located in Jersey City, NJ's waterfront Liberty State Park, reopened in 2007 after a \$109 million renovation. (Photo: Courtesy EwingCole)

Below: At the Language Karaoke station, guests choose a language and a country location, then try to speak the language using a video prompt. The video is composited using green screen technology and played back in fun and unexpected ways. The brain sculpture lights up when guests using touchscreens discover the regions of the brain where communication signals are sent, received, and interpreted.



In a world where science and technology dramatically affect our everyday lives—think global warming, pandemic disease, and nanotechnology—science museums share the critical mission of educating visitors to make good choices about the way they live, work, and play.

In 2005, New Jersey's Liberty Science Center looked in the mirror and faced the fact that it wasn't up to the task.

"Everything needed to change," says Wayne LaBar, the center's vice president of exhibitions and theaters. "There were visitor flow and service issues that required drastically changing the architecture. And from a content standpoint, we were completely out of date. It was 2005, and we were still talking about the Intel processor that came out in the early 1990s."

The museum's soul searching resulted in a 22-month, \$109 million upgrade of its exhibitions, programs, and theater experiences. In 2007 it reopened on Jersey City's waterfront with 295,000 sq. ft.—including eight new permanent exhibits in 60,000 sq. ft. of exhibition space—designed to engage visitors of all ages in the science and technology of living, learning, and working in the New Jersey/New York region.

Planning for change

Using new technology to tell stories about science and technology seems only logical. But technology doesn't stand still, and integrating it into museum exhibits meant to last five to 10 years is a huge challenge.

"We know that any technology can become old hat quickly, or not pan out over time," says Ann Neumann, director of design and new media. "That's why our focus always came out of the content. We looked first at the message we were trying to convey, then designed experiences that would convey those messages."

The in-house design team worked with advisory committees, steering groups, and content consultants for each of the center's eight major exhibits, and collaborated with more than 30 media providers, technology consultants, and fabricators to communicate the ideas using technology and media.

Rather than focusing on particular technologies and how they work, the team looked for ways that visitors could explore the exhibit content by interfacing with technology in new and innovative ways—ways they couldn't experience at home, says Neumann. "We wanted their experiences here to be larger than life."

LIBERTY SCIENCE CENTER

Location: Jersey City, NJ

Client: Liberty Science Center

Architecture: EwingCole

Exhibition Design: LSC Experience Services

Design Team: Wayne LaBar (vice president, exhibitions and featured experiences); Ann Neumann (director, design and new media); Ellen Lynch (director, exhibition development); Helene Alonso, Denise Bressler, Jon McCollum, Karen de Seve, Rich Weddle (exhibition development and project managers); Matt Grasso, Carol Huang, Katherine McCusker, Anthony Lualdi, Carlos Fierro, S2 Associates Inc. (exhibition designers); Elizabeth Grotjohann, Robert Homack, Judeann Hook, Greg Blackburn, Pakenee Kittipinyowat, Josh Whitehead (graphic and environmental design); Jim Austin (electronic media design); Tony Morales, Joel Svertz (video production)

Multimedia Production: Chedd-Angier-Lewis, Moey, Quatrefoil Associates, Swim Design Consultants, Windenrane, Ideum, The American Sign Language Project, Creative Machines, Henry Kaufman, Magian Design Studio, Stephen Lewis, Swim Design Consultants, Unified Field

Exhibition Fabrication: Art Guild

Specialty Fabrication: Boundary Layer Wind Tunnel Lab, University of Western Ontario, Creative Machines, Entech Creative Industries, The Nassal Company, Onomy Labs, Quatrefoil Associates, Ropes Courses

AV/IT Design and Network: Electrosonic Inc.

Exhibition Lighting: Available Light

Acoustical Consultant: SH! Acoustics

Photos: ©Liberty Science Center 2007/Denis Finnin

Handprints were man's earliest form of communication. Liberty recreated the gesture in a high-tech way, allowing visitors to leave their own prints behind on a projected cave wall. Cameras behind the wall take pictures of their hands and sophisticated image recognition software translates the images into negative prints.



Digital and universal

Planning the center's 7,500-sq.-ft. Communication exhibit, for example, the team became fascinated with the first-known marks of human communication—handprints left on ancient cave walls. They wanted to create an iconic exhibit that would allow visitors to make the same gesture in a very contemporary way.

On a projected "cave wall" inside the space, visitors can leave their own handprints. Cameras behind the wall photograph the outline of their hands and sophisticated image recognition software translates the outline into a negative print, similar to those left when early cave dwellers blew tinted charcoal dust through straws around their hands. The digital handprints slowly fade a few minutes after the impressions are made.

In the same area, a 10-ft.-long digital Graffiti Wall helps visitors understand urban street art as a form of written communication. The Graffiti Wall works with a semi-permeable screen, a camera, and a projector. Users point a light source at the screen and the camera picks up the light, assigns its position to a two-dimensional axis, and the projector projects this data as virtual spray paint.

Touchscreen kiosks and interactive tables abound throughout the center. Touchscreens prompt visitors with questions about the content

areas, then allow them to see how their answers compare to others. A multi-touch screen focused on the origins of language allows social exploration of topical issues. Multiple users can explore the topic simultaneously by touching and dragging content modules, collecting notes, making charts, and voting on their theory of how language developed.

Wiki museum

Perhaps the most profound way the LSC team uses technology to engage visitors is allowing them to shape their own experiences and change or add to the museum content. Exhibit Commons is a set of exhibits that makes visitors the curators—encouraging them to participate in both low- and high-tech ways.

Through the center's website, for example, visitors can access codes that allow them to reprogram the visual effects on the Graffiti Wall. In the Eat and Be Eaten exhibit, they can use their cell phones to download additional information about animals and plants. In an exhibit focused on the Hudson River, they can create video dialogues to add to the center's narrative.

Liberty is also using social networking to engage visitors and create new content. As part of a new exhibit on the science and technology of

In the center's three-story atrium space—dubbed the Times Square of Science and Technology—headlines of RSS feeds of the latest science and technology breakthroughs are displayed on vertical LEDs and images and text are projected on huge-scaled sculptures suspended from the ceiling.



cooking, the team created a networking site where people can tap into the minutes of team meetings, contribute ideas, and be involved with the design process from start to finish. "We're basically asking them to contribute to the cumulative knowledge base, and we've learned a lot already," says LaBar.

On the low-tech side, the content of some exhibit components is based on visitor votes. In an exhibit focused on the science behind presidential elections, visitors cast ballots and can analyze the voting results by age, sex, ethnicity, educational levels, and other factors. In the Skyscrapers exhibit, visitors leave handwritten postcards that become part of the content.

"We've discovered these approaches are very popular and interesting to people—and reflective of a society where, on the Internet, everybody is able to contribute in a variety of ways," says LaBar. "It adds meaning to their experience and also provides evergreen content for us that's supportive of our mission."

Setting the standard

Neumann, LaBar, and their LSC colleagues worked with a cast of hundreds of media providers, consultants, suppliers, and fabricators to make the center a model of technology integration and science

education. With so many players and so many different technologies to address, a sound development process and a consistent set of standards were critical.

"Tying our standards and expectations back to the content provided a framework and consistency of approach across all the exhibits," notes Neumann.

For example, creating elegant and simple interfaces for screen-based media was mission-critical. "We created and documented the concepts we wanted to convey, and often described the interface with the guest to achieve the outcomes," explains Neumann. "We provided a lot of direction on things like what the default screen would be and how to navigate as intuitively as possible."

For each content area, the team issued RFPs to firms or individuals they thought best suited to each experience. "Their responses and creative additions to the process informed our final choice of collaborators and helped form the final experiences," adds Neumann.

To ensure consistency across all the exhibits, LSC hired a single firm (Electrosonic, Burbank, CA) to spec and install all networked A/V equipment. Art Guild (Thorofare, NJ) was the primary exhibit fabricator, and had worked with Electrosonic in the past. "On projects like these, where media are such a big part of the installation, it's

At the Graffiti Wall, visitors explore urban street art as a form of communication and make their own digital tags. Guests point a flashlight at the semi-permeable screen and a camera picks up the light, assigns its position to a two-dimensional axis, and a projector projects the data as virtual spray paint.



always best to work with the A/V systems integrator very closely and from the beginning," says George Mayer, president of Art Guild.

Working with a client who was also the project designer was helpful during an extremely tight installation schedule, says Mayer. Construction delays meant that exhibits were being installed in some cases before carpeting was down and while scaffolding was still in place. "When value engineering decisions needed to be made, things happened a lot quicker because we had only one coordination point."

Sharing the knowledge

The 16-person LSC Experience Services team now works not only on exhibitions for their own center, but for other museums and science centers as well. It was a natural extension of the two-year LSC project, says LaBar.

"We made the conscious decision to do the exhibit design and development in house. Near the end of that process, we wondered, 'How will it be possible to keep everyone this excited all the time?'"

At the same time, other museums were calling LaBar and his staff to ask about their project and learn from the LSC expansion. So LSC Experience Services was born. Says LaBar, "We see it as a way to earn revenue for our center, and consistent with our own mission, always keep learning." *



The Infection Connection's Subway Theatre is an immersive environment created to simulate a subway train ride. Subway windows are large plasma screens playing a 12-minute video about the spread of four infectious diseases, accompanied by all the sounds and vibrations of the commute.

Signs
Environments
Graphics
Designs

segd DESIGN

Mark your calendar for the 2012 Annual Conference.

ANN MEIDAM

LIBERTY SCIENCE CENTER

222 JERSEY CITY BLVD
JERSEY CITY NJ 07305-4636

POSTAGE
PAID
YORK, PA
PERMIT #366

