

**Case Study: Education**

Soundscaping the World's Largest Multi-touch Installation

How Tesira® Brought Responsive Audio to the QUT Cube

When was the last time you stood next to a life-size whale while absorbing the sounds of an entire underwater ecosystem? What's it like to sit behind the wheel of an eco-powered car? Ever play with the chemical properties of an 18th century painting? At more than two stories tall and 46 feet wide, the Cube at Australia's Queensland University of Technology (QUT) is a virtual playground of discovery. Considered the world's largest interactive multi-touch display, the boomerang-shaped attraction allows visitors to engage directly with enormous exhibits such as a virtual reef, an energy-efficient driving simulator, and a physics playroom where participants create and disassemble a series of objects to learn more about the wonders of science. The Cube combines projected edge-blending images, dozens of interactive monitors, and an ambient audio system that gives participants an all encompassing and highly educational experience.

"The idea for an interactive display was part of a vision to place our university at the forefront of innovation and research," said Gavin Winter, QUT's Project Manager for the Cube. "Already a leader in the fields of science and engineering, QUT was looking for a tangible way to show the local community, prospective students, and the entire world that we are capable of producing amazing ideas that can engage people to actively learn about the marvels of science. But this could only be achieved by creating something truly unique. We brainstormed for weeks, yielding some very creative ideas that eventually led to a massive animated cube that we sketched on a napkin. We had the idea, now all we needed was to find the partners, technology, and expertise to make it come to life."



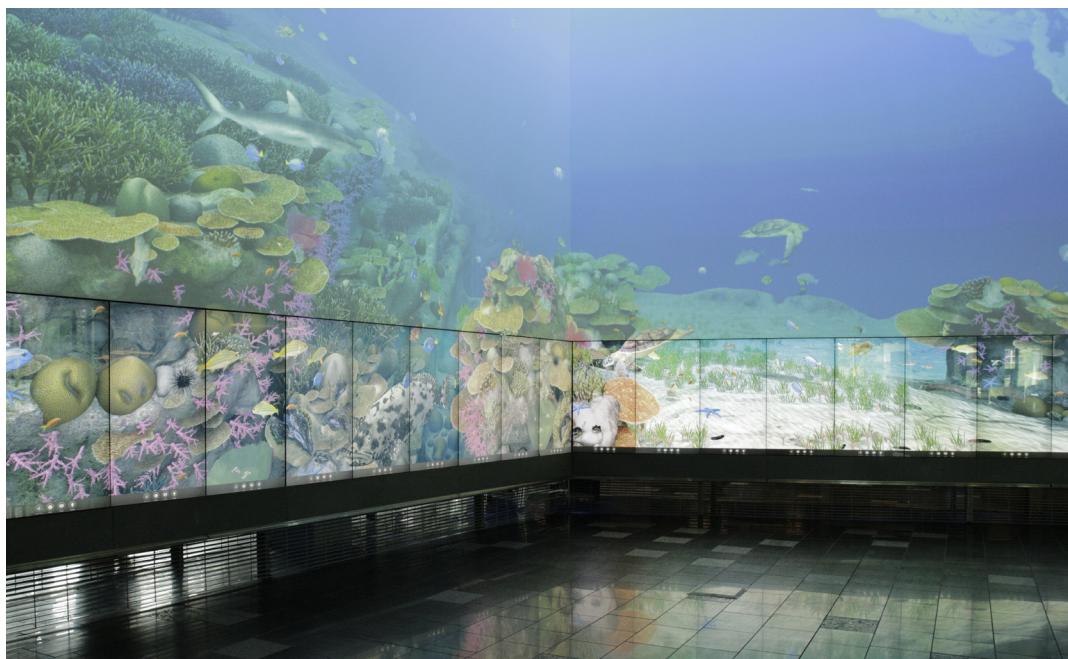
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*-Shannan Brooksby,
Technology Solutions Specialist
ProAV Solutions*

THE CHALLENGE

As technology winds its way deeper into the university experience, institutions are increasingly seeking innovative concepts that will allow their students, faculties, and brands to shine in a competitive global market. This project accomplished all of that. "The Cube was a significant undertaking and investment by the university," continued Winter. "In addition to showcasing the potential of our university, the project's primary focus was to enable engaging installations that could reach younger generations of students, encouraging them to consider an education in science and engineering. Since a younger audience is already immersed in technology with every facet of their lives, connecting with them meant selecting sophisticated solutions that would really fire up imaginations."

Totaling six separate display zones, the AU\$3.5 million installation blends projected images to create a fluid two-story screen of animated video. 20 touchscreen panels allow users to interact with and control content by moving their fingertips across the displays. All images respond in real-time via infrared camera technology incorporated directly into the panels. These panels sense both the physical presence of participants as well as the movements of their hands - allowing integrator ProAV Solutions to align the screens sequentially for a truly interactive experience. With the interactive displays in place, Project designers realized that they needed a robust audio solution that would keep pace with the stunning visual technologies, and complete interactive experience for Cube visitors.



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-Shannan Brooksby, *Technology Solutions Specialist
ProAV Solutions*

SOLUTION

"The key challenge for such an immersive video experience was designing an audio system that could handle the demanding task of following images within such a complex matrix setup," said Shannan Brooksby, Technology Solutions Specialist at ProAV Solutions. "This meant selecting a solution that was not only extremely flexible but also had a high degree of customization, allowing us to easily adjust the system's audio properties to match the acoustic considerations of the space." In order to meet these demands, the team turned to Biamp Systems' Tesira® digital audio processor, allowing them to create a unique content-driven audio experience for every user, regardless of what was happening in another area of the screen.

"Tesira also cleared the way for us to more effectively surround participants with a captivating soundscape and responsive audio whenever an onscreen object is selected – whether it's the song of a looming whale or the flow of a small water fountain. Every detail imaginable was considered, resulting in a hands-on AV experience that's unlike anything else on the planet."

Working within a structure made of stone and concrete where walls of different shapes could impact the sonic integrity of the installation, ProAV required an audio solution that could engage participants while circumventing the acoustic limitations of the area to create a seamless-sounding exhibit. Biamp Systems' Tesira® digital audio processor, allowed them to create a unique content-driven audio experience for every user, regardless of what was happening in another area of the screen. Integrated with more than 25 hidden element dipole speakers, the audio system provided networked digital signal processing customizable configurations, and the raw processing power needed to transport audio via approximately 96 inputs and 80 outputs.

"Our main reason for selecting Biamp's Tesira platform was audio flexibility," added Brooksby. "We were able to easily introduce new audio signals as the project progressed and distribute them to any of the displays without much tweaking or intervention. This made the solution feel like more of a set-and-forget box than a system designed to handle large-scale installations, which was immensely useful when implementing such a complex design. In terms of sound quality, the Biamp solution allowed us to nail down the exact atmosphere needed for this type of project, letting visitors walk around the exhibit without being disturbed by intrusive audio. This balance of response-based sound and ambient audio creates a truly cohesive work of art, and feedback from users has been extremely enthusiastic."

SYSTEM SPECIFICS

COMPONENTS:

(4) Tesira SERVER-IO AVB

- (4) DSP-2 Cards
- (24) SIC-4 Cards
- (20) SOC-4 Cards

(1) NETGEAR® GST724 AVB Switch



QUALITY MATERIALS AND STRONG DESIGN BENEFIT THE COMMUNITY

Designed over a two-year period, the Cube allows teachers and students to actively discover the innovative potential of QUT's scientific community. A steady stream of teachers are now using the installation to carry out their lesson plans directly on the facility's walls – giving them access to photo-realistic moving images, crisp ambient audio, and response-based interaction that provides tomorrow's generation of academics with a unique sensory experience that opens the scientific imagination.

"The visual aspect of the space has an immediate impact on our visitors," said Winter. "We can't forget that it is the audio that completes the entire experience. Going forward, audio will continue to play an integral part of the project as we roll out new installations. The Biamp system will allow us to grow and include new exhibitions that will further the Cube's vision of delivering immersive, memorable experiences that promote our love of science."



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ABOUT BIAMP SYSTEMS

Biamp Systems is a leading provider of innovative, networked media systems that power the world's most sophisticated audio/video installations. The company is recognized worldwide for delivering high-quality products and backing each product with a commitment to exceptional customer service.

The award-winning Biamp product suite includes the Tesira® media system for digital audio networking, Audia® Digital Audio Platform, Nexia® digital signal processors, Sona™ AEC technology and Vocia® Networked Public Address and Voice Evacuation System. Each has its own specific feature set that can be customized and integrated in a wide range of applications, including corporate boardrooms, conference centers, performing arts venues, courtrooms, hospitals, transportation hubs, campuses and multi-building facilities.

Founded in 1976, Biamp is headquartered in Beaverton, Oregon, USA, with additional engineering operations in Rochester, New York, USA and Brisbane, Australia. For more information on Biamp, please visit www.biamp.com.