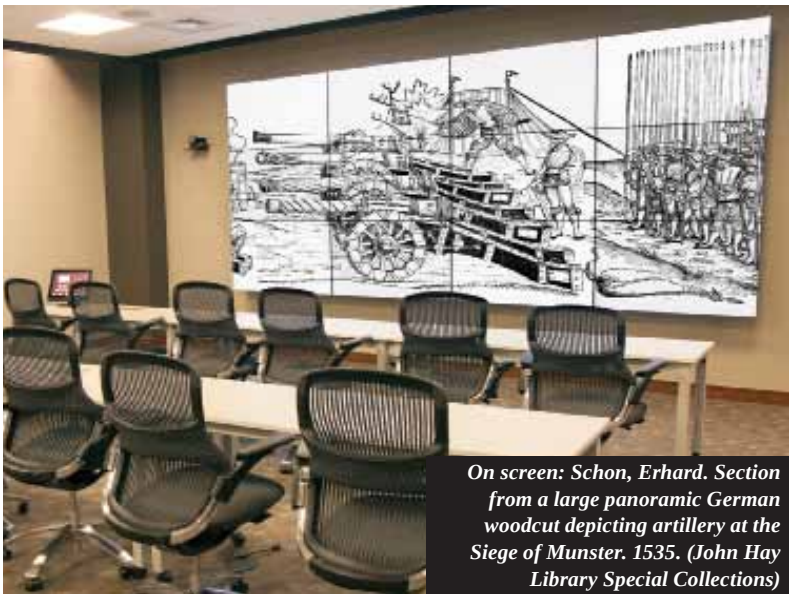
BROWN UNIVERSITY



On screen: Schon, Erhard. Section from a large panoramic German woodcut depicting artillery at the Siege of Munster. 1535. (John Hay Library Special Collections)

EQUIPMENT

- 12 NEC X551UN 55in. thin-bezel LED monitors (1920x1080)
- Ambient Sound custom wall-mount system
- Computer workstation with 2 AMD FirePro W600 graphic cards, each with six 1920x1080 outputs
- 2 Touch table devices
- 2 Computer workstations running Windows 8
- 2 Panasonic 50in. TH-50PF30U plasma displays with TY-TP50P30K dual-touch overlay
- 2 Da-lite MM5C-39FS rolling videoconferencing carts
- Crestron DM-MD32X32 DigitalMedia matrix switcher
- 14 Crestron DM-TX-200-C-2GWALL DigitalMedia 8G+ transmitters
- Crestron TPMC-V15-TILT-B touchscreen
- Crestron AV2 dual-bus control processor
- Tandberg C60 video conferencing codec

It was never quite right to think of libraries as mere repositories of knowledge. Scholars have always used them as places to synthesize information, draw inferences, and create new works extending human understanding. Yet Harriette Hemmasi, Joukowsky Family University Librarian at Brown University in Providence, R.I., suggests that the library's role in these activities can and should accelerate.

"There's great opportunity to interact in new ways with scholarly information and build on it in our new visualization laboratory," she explains. "While it once took years or even decades to analyze and get a sense of what was known about a particular topic, now we can find, access, contrast, compare, and draw inferences from vast amounts of data quickly and collaboratively."

The concept behind the Patrick Ma Digital Scholarship Lab seems simple. It's essentially a classroom dominated by a 7'x16' videowall that's tied into a media network based on Crestron DigitalMedia technology.

In practice, however, the lab is much more. It is breaking down barriers for teaching and scholarship in four important ways:

1. As a conceptualization device: When used as a single high-resolution display, the videowall allows scholars, teachers, and students to visualize the meaning of large sets of data. "All disciplines are becoming more data intensive and data aware," Hemmasi explains. Yet human beings often have difficulty conceptualizing what they cannot see. "For example, one of our professors has been using data sets from our high-performance computing facility to create extremely detailed visualizations, illustrating concepts in planetary science that might not otherwise be possible to explain."

"Some of the visualizations we've tried here have been spectacularly successful," adds Patrick Rashleigh, Data Visualization Coordinator for the library. "Here's a simple example: Geographical information is very powerful in this lab because it allows you to see the larger landscape but then zoom in to grasp the finer details. You can't do that on a smaller display, because when you zoom in you lose the context and when you zoom out you lose the details."

2. As a comparison device: The videowall can also be divided, providing from two to 12 high-definition images for side-by-side comparisons. "We have compared satellite images of changing landscapes, so you can see bodies of water shrinking over time, and we have also compared pages from rare manuscripts,"

Rashleigh says. “Even a single display, 1/12 of our videowall, provides an impressive 1080x1920 resolution.”

3. As a collaborative device: The lab includes 14 AV inputs to allow multiple students and scholars to simultaneously display material from their own laptops and other devices.

An additional set of tools—two computers running Windows 8 with touch support and 50in. touch-sensitive displays—add to the collaborative analytic process. With these systems, small groups of users can manipulate data and images with their hands, outputting to any section of the videowall or the wall as a whole.

4. As a communications device: The lab is also helping the library blur the boundaries between the campus and distant locations. “We have a class on African issues booked for the spring semester,” Rashleigh says, “and we’ll be bringing in speakers regularly from Africa through videoconferences.”

The original Microsoft Surface demonstration unit, with its 30in. touchscreen and a section of the Garibaldi panorama on display. The finished system uses two 50in. Panasonic displays with DualTouch overlays and Windows 8 for touch support.

The idea behind the Digital Scholarship Lab began when the Library commissioned a fine-quality digitization of the Garibaldi panorama, a fragile 4.5’x270’ historical document, painted on both sides, depicting the life and work of Italian patriot Giuseppe Garibaldi. “Andy van Dam, a distinguished computer science professor at Brown, along with several of his star students, built a prototype environment using Microsoft Surface that enabled easy, multi-touch access to the massive scroll and related research documents. It was a great learning tool, but with only a 30in. screen, it was good for just three to four users," Hemmasi says. The next step was to look at larger screens, and as they explored that possibility they began to realize what a visualization lab could achieve. The lab is based on three key technologies, implemented by systems integrator Ambient Sound in Warwick, R.I.

According to Joe Madritch, the project manager for Ambient Sound, it was crucial to be able to bring any source, whether digital or analog, into the videowall or any section of the wall at full resolution and the highest possible quality. They would also need the ability to switch a large number of sources into a large number of display configurations without loss of quality.

“Brown had already standardized on Crestron DigitalMedia technology, and that was the ideal choice for this setup,” Madritch explains. Ambient Sound engineers Tom Barrett and Josh Hogan designed a system using a DigitalMedia switcher with 32 inputs and 32 outputs, carrying all video and audio signals on DigitalMedia 8G cable on a high-bandwidth IP network. The inputs include 14 Crestron wall plates, each able to accept HDMI, VGA, USB, and stereo audio connectors; the two touchscreen-equipped computers; a Tandberg C60 videoconferencing system; a Blu-ray player; and 12 additional audio/video outputs from the room’s dedicated computer workstation.

Video processing was also a concern, as Barrett and Hogan needed to display extremely high-resolution images from the lab’s dedicated workstation. They decided to equip this workstation with two AMD FirePro W600 graphic cards, each able to output six 1920x1080 images to individual displays or, in combination, a single 7680x3240 image across 12 displays. The videowall consists of 12 55in. NEC X551UN LED monitors hung on the wall of the lab using a custom-designed mounting system. Output from the video cards or various other sources comes to the appropriate monitor via the DigitalMedia switcher.

For the two Windows 8 systems, the Ambient Sound engineers recommended the use of Panasonic 50in. TH-50PF30U plasmas, each equipped with a Panasonic TY-TP50P30K Dual-Touch overlay, mounted horizontally on a Da-lite MM5C-39FS rolling videoconferencing cart. Users standing at the table-like displays manipulate data and images using the touch screens and their work is enlarged on the videowall.

Hogan and Barrett decided to operate the routing of the various signals using Crestron control with a 15in. touchscreen providing the user interface. “I tried to make it as intuitive as possible,” Hogan reports. “You simply select an image of your display destination, whether one screen, two, four, or all 12, then touch what you want to send to that display.” Hogan also included, on separate menus, controls for the lights, the Blu-ray player, and the videoconferencing system.

FOR MORE INFORMATION

View a short video about the Patrick Ma Digital Scholarship Lab on the Brown Library at library.brown.edu/dsl.