Didaktek with three of the four screens in view

TO BUILD A HOME

Anna Mitchell reports on the new Aarhus School of Architecture and finds AV systems playing a fundamental role in shaping the architects of the future.

Architects and AV integrators have a complicated relationship. At its best, architects will create spaces that sound great and deliver environments where digital technologies can be seamlessly woven into a building's fabric; collaborating with AV professionals to make offices, schools, universities, concert halls, museums and more work for their occupants. At its worst, spaces will be designed with scant regard to acoustics, the need for cabling or mounting of essential AV technologies. AV integrators can be left grumbling that they are brought in late to projects when nothing can be done to the fabric of a building, their elements merely expected to be tacked on, while also being warned not to ruin the aesthetic.

The way that relationship goes can make or break a project. So, what can happen when a dedicated building to teach future architects gets a chance to be constructed from scratch, with generous funding and an appreciation of the importance of AV from the outset? Could this be a chance to not just provide a space that works for students of today, but help create architects that will build better buildings of the future?

That's being put to the test thanks to a new home built for the Aarhus School of Architecture, a prestigious institution that's been training architects in Denmark since 1965. For many years the institution was spread out over nine addresses that housed teaching spaces, studios and workshops, dotted across the city.

Thanks to funding from the government the school was able to build a new home that brought those spaces together, creating a base for its students as well as facilitating greater engagement with the local community in Aarhus. Crucially the A.P. Møllerske Støtte fond (A.P. Moller support foundation) contributed with a donation to uplift the library and education spaces. A.P. Møllerske Støtte fond, a benefactor of the project, also brought in the expertise of AV consultant and integrator Stouenborg.

Plans that started five years ago reached their conclusion in October 2021 when the new school hosted a week of opening events, drawing Danish Royalty, politicians, those who donated funds to the project and CEOs of some of the biggest architectural firms in the world together with the school's staff and students.

The four-storey building houses workshops, a library, seven lecture rooms, an auditorium and Didaktek, an unconventional teaching and presentation room, roughly translated as a didactic teaching space. The AV system across the building is networked, relying on a Crestron NVX system to distribute the signals within the building and also outside for live streaming or Microsoft Teams and Zoom meetings. AES67 and Dante are used to route sound throughout.

"Everything is network based on a Cat7 network, we only have very few analogue lines in the whole building for control room loudspeakers," confirms Anders Jørgensen, consultant and project manager at Stouenborg. The two main presentation

Photos: Nalle Magnusson

The auditorium at Aarhus School of Architecture
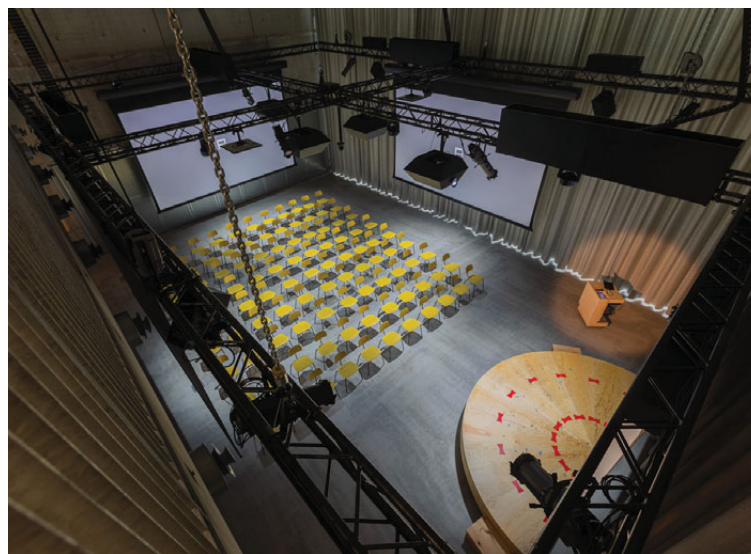
[L-R] The main auditorium and Didaktek from above showing the the large rig

spaces are the auditorium and Didaktek and each has an associated control room. The spaces are split by a partition wall that can roll back to combine them, while the networked AV system makes it easy to share inputs across the two rooms, spilling out to the other lecture rooms if desired. When combined, 400 people can come together in these two presentation areas.

Kristine Leth Juul, prorector of the Aarhus School of Architecture, says one of the aims for the new building was to not just improve the institution's teaching spaces, but move them many steps forward.

The auditorium has a Meyer Sound Constellation system that day-to-day delivers voice lift and facilitates natural question and answer sessions. Jørgensen adds other reasons why Constellation was vital to the success of the auditorium: "With the new building there was a push to collaborate and interact with other artistic institutions. For example, in collaboration with the Royal Academy of Music Aarhus.

"You can also show architectural students how acoustics work and how acoustics can impact on a space both positively and negatively. You can tell them what reverberation time is, and then actually demonstrate that. We can shut the Constellation system off, we have a reverberation time of 0.35 seconds, we can then build on that until we reach 3 seconds and

effectively have a cathedral. We can show them what happens with early reflections, we can show them what happens when early reflection is taken away."

Two ceiling mounted Panasonic PT-RCQ10B projectors beam onto the auditorium's 10m x 3m projection screen; a landscape format was chosen to support teaching with two screens and the ability to present widescreen content. Stouenborg also built an acoustic wall behind the screen that was specially made for this project only. Mersive Solstice supports content sharing, Vaddio RoboShot cameras capture the action within the space and all control is accessed via Crestron TSW-1060 control panels.

The Didaktek was very much driven by a vision from the Aarhus School of Architecture teaching staff. "We wanted a space that was inclusive and inspiring," Leth Juul explains. "We're discussing spaces and talking about how to create 3D environments so we wanted to find out how we could create a 3D space using digital media.

"This wasn't to be a 2D solution, like you would have in a classic auditorium, where the lecturer stands at the front, and the audience is passive. This needed to be a new learning environment where the listener is active."

Leth Juul was also aware that the shift in approach mirrored how architecture has evolved with digital tools. "The students are working in 3D on their

computers all the time. We wanted to see if we could somehow create a space, where the drawings could be taken into a new 3D space by the use of digital tools."

The Didaktek has a huge ceiling height and a rig with four Panasonic PT-RZ120 projectors, Vaddio RoboShot 30E cameras and Martin ELP moving lights. Four Projecta Extensa projection screens (6m x 3.4m) can be lowered up and down. A Shure ULX-D wireless microphone and Microflex Advance ceiling array microphone systems are also provided and Mersive Solstice supports content sharing.

There is a Meyer Sound Spacemap Go system in the Didaktek that is primarily used to position sound in the room. The audio system that comprises Meyer Sound Ultra-X40 point source loudspeakers and USW-210P subwoofers also has the capability to deliver an immersive sound experience.

With the screens up, the space can be used for exhibitions but the combinations that can be created by lowering some or all of the screens offer multiple, flexible uses. "If you want to do a presentation you can chose which side you want to use, and where you want to stand, external presenters and video feeds can be brought in via videocall," explains Jørgensen.

"Also, the school has an architectural CAVE that is around 15 sq m so you can only fit two to three people in it at a time. Even though we are not covering this

This needed to be a new learning environment where the listener is active.

Kristine Leth Juul, Aarhus School of Architecture

Kit List

Audio
Meyer Sound Constellation, Spacemap Go, Galileo Galaxy network platform, Ultra-X40 and UP-4slim loudspeakers and USW-21oP subwoofers

Shure ULX-D wireless microphone systems and Microflex Advance ceiling array microphones

Yamaha MRX7-D audio processors

Control and distribution
Beckhoff controllers

Black Box Wizard SRX KVM extenders

Cisco SG350-10MP switches

Crestron DM-NVX encoders and decoders, 3-Series control systems, TSW-1060 touchpanels and Cameo keypads

Luxul Epic 5 router and AMS-4424P switches

Neets switching relays

Netgear GS724T switches

Vaddio AV Bridges

Lighting
ETC Irideon FPZ trackmount lights

Martin ELP lights

Video
Beetronics monitors

Mersive Solstice Gen3

Panasonic PT-RCQ10B, PT-RZ120 and PT-RZ570 projectors

Projecta Extensa and Elpro Concept screens

Vaddio RoboShot 30E and 12E cameras

> You can also show architectural students how acoustics work and how acoustics can impact on a space both positively and negatively.

Anders Jørgensen, Stouenborg

[L-R] One of the smaller lecture spaces and Stouenborg's custom-built furniture housing AV kit

space with video from corner to corner, you can fit around 50 people within the four projection screens to view the models in an immersive space.

"Students can also exhibit their projects, showing a physical model with supporting images and materials projected alongside. The cameras and lighting in the rig mean the model can be lit and viewed from above."

Leth Juul outlines a recent use case where a lecturer was livestreamed in from America: "We had students in the space, filmed from above, drawing and writing questions for the guest speaker. The lecturer was shown on the screen, and you could see his slides and presentation. It was a powerful way to blend the physical and the virtual. We're learning entirely new ways we can use this day-by-day."

With so many options and possibilities, how did Stouenborg make sure students and staff could make the most of the options, while not being overwhelmed with complexity?

"We tried to narrow everything down into an intuitive interface on a Crestron touchpanel," answers Jorgensen. The resulting interface represents more than 500 hours of programming time for Stouenborg's programmer Nicolai Gubi Schmidt and offers a simple overview of the space with drag and drop operation. "For example, when you drag a signal to a particular screen, the projector starts up, the screen rolls down and the sound is routed to that speaker," adds Jorgensen.

"We actually have three rooms here," Jørgensen continues. "When you open the partition between the auditorium and Didaktek it's another unique space."

What's clever about the Constellation system here is it brings the two spaces together, working from the auditorium to illuminate the Didaktek. "In reality it means we've raised the ceiling of the auditorium acoustically to match the ceiling in the Didaktek. The two spaces have the exact same acoustic settings," says Jørgensen.

Stouenborg also kitted out seven smaller lecture rooms with AV. The rooms vary in size, accommodating anywhere between 20 and 60 people per room, and are all built around the same basic technology template.

Panasonic PT-RZ570 projectors fire onto motorised Projecta Elpro Concept projection screens. Vaddio RoboSHot 12E cameras with 30x zoom and Shure Microflex Advance ceiling array microphones capture proceedings that can be shared across the building, livestreamed or used to connect across the world via Zoom or Teams. In-room audio is handled by Meyer Sound UP-4slim cabinets. Everything is controlled from Crestron TSW-1060 control panels and Mersive Solstice supports content sharing.

"All of the gear is chosen from the best," says Jørgensen. "Even if it's a small room for 20 people, it's good quality audio, it's DLP 1-chip laser projection with 5,700 lumens."

Unsurprisingly the Architectural school's new home is a striking

building. Much of the interior is bare concrete walls with the cabling concealed in floors and ceilings or metal piping. To fit the aesthetic, Stouenborg's recently established furniture department was able to create nine pieces of specialised AV furniture to compactly house touchscreens, PCs and connectors.

Stouenborg assembles and programs everything in its tool shop off-site. "We have a rig where we mount the whole thing, all the racks are tested and we have burn in periods of 40 days," says Jørgensen. "It saves us a lot of hours on site and allows us to work out the systems and iron out any problems in a controlled environment."

There's no doubt the Aarhus School of Architecture has vastly better spaces within which to learn thanks to the new building. It's a huge upgrade and the possibilities for streaming and the ability to work in 3D spaces are new, while the spaces also offer fantastic facilities for neighbouring institutions and the city.

Leth Juul also says Stouenborg added valuable expertise in acoustics, avoiding what she terms "headache spaces". It's a nice indication that the spaces and the technologies might just inspire Aarhus' architecture students to create great sounding buildings in the future. And with Jørgensen saying currently "seven out of ten architects have no clue about acoustics", maybe the architects graduating from Aarhus will help tip that balance. 🌐