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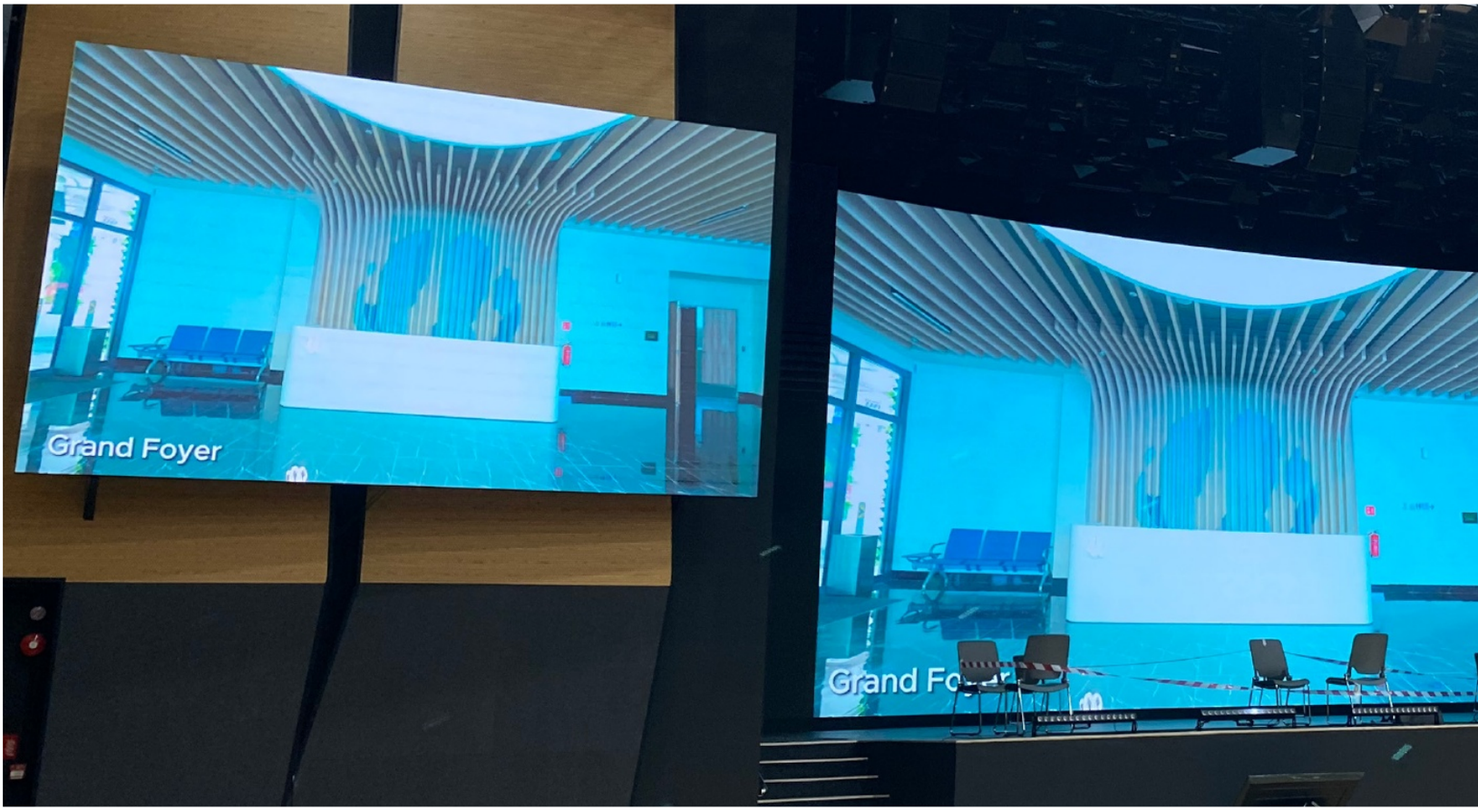


AV IN THE FABRIC OF LEARNING

The Education Project category at the Inavate APAC Awards 2024 was the most competitive it has ever been. **Hurrairah bin Sohail** discovers why One World International School, Singapore scored the win.

Technology is becoming ingrained into the fabric of learning and teaching spaces. No recent project we have covered embodies this better than One World International School (OWIS) in Punggol, Singapore.

Nigil Antony, deputy divisional manager, projects at Global Schools Foundation, talks about OWIS's aspirations and approach to technology: "Our intention was to build a true 'digital' campus that would meet the expectations of our users. And this intention has been translated into action and outcome via our investment in technology."

But what is digital? Antony answers: "To us it was a concerted effort to make sure that we looked at technology as a whole and made sure it was all connected. So, we upgraded our LMS system. We upgraded our user interface; with RFID cards and linked those with access, security, and usage. And then we built the experience with the help of AV technology in spaces such as our amphitheatre, seminar rooms, sports fields, classrooms, and more."

He continues: "Our top management is tech-savvy, and this tech-savviness is evident if you just look at the level and quality of technology we have chosen and the functions it enables. I believe a clear example of our approach to technology can be found in our auditorium. It was built in 2018, but we're in 2024 now. We have achieved the performance levels and quality of a commercial venue.

"The auditorium expanded from a seating capacity of 500 to 1,500 and our technology has evolved to keep pace with this expansion. The decision to go with Yamaha AOC 4, which according to Yamaha is the first deployment of its kind in APAC, was to make sure that our auditorium would be top of the line. We are Dolby Atmos-capable with the 11.1 system we have deployed, and we are ahead of the 7.2 configuration that is commonly used today making us future-ready. And this commitment to quality is not just reserved for our auditorium system. The Black Box is also Dolby Atmos-capable showing that we took a holistic approach to technology and examined the needs of the spaces when choosing products."

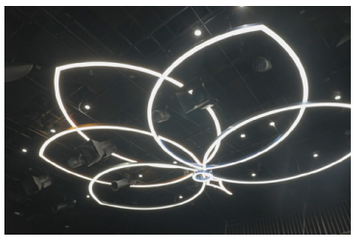
OWIS selected ESCO to be its technology solution provider for the audio-visual systems. Alpha Acoustics was the consultant for the project.

With the approach to technology crystal clear, and the partnership between OWIS and ESCO established, it was time to get to work.

Starting with the entrance lobby at OWIS, LP Display flexible LED tiles with 2.5mm pixel pitch are used to create a 6.24m-wide and 4.32m-high LED videowall in the foyer of OWIS.

OWIS has standardised its digital signage system to use M Fusion PCs and players. However, Magnimage controllers and processors have been provided for the LED videowall to function on its own if the school decides to change its content strategy.

Ratheesh, senior project manager at ESCO, provides details: "Initial designs indicated that there was no LED videowall in the lobby, it was meant for a different location. However, after



the LED had been ordered, the decision was made to bring the videowall to the lobby. We had to change the fabricated structure, and the LED panels were flexible so they were for a specific purpose. However, we were still able to morph the videowall to a new form, and this adds a new dimension to the lobby and it works really well."

From the lobby, we jump to the auditorium which Antony has already discussed. It bears to compare the new OWIS auditorium at the Punggol facility to the version at the older campus. The old auditorium was equipped with JBL line array stacks and an extremely large curved, non-standard LED videowall. There was a concerted effort to upgrade the experience with the new auditorium.

Consequently, the new auditorium features four LP Display LED videowalls. The main videowall measure 13.44m-wide and 6.24m-high and is flanked by two smaller LED videowalls that measure 4.8m-wide and 2.88m-high.

The fourth display is on an adjacent wall and measures 0.96m-wide and 6.24m-high. It is primarily used as a scoreboard to ensure that the space can serve as a multipurpose hall when required. The seating is also modular and can be moved out when required to facilitate multipurpose function.

The LED tiles used for the displays in the auditorium all have a 2.5mm pixel pitch.

Yamaha speakers, paired with Nexo amplifiers and DSPs, are used to provide audio. The space is speaker dense and in total there are 108 speakers in the auditorium.

Ratheesh provides insight: "Since this is an AFC deployment, the density of speakers was required. During the installation, there was a directive from the architect to not have anything mounted on the panels. This meant that we had to put in 10 additional speakers. The initial design had equidistant speakers, but we had to make adjustments to maintain the aesthetics and maintain the coverage."

The OWIS auditorium is Dolby ready, missing out on Dolby certification due to a technicality as it is not a commercial venue.

Due to the size of the auditorium, two control rooms have been established and these are linked via fibre to facilitate operations. One control room serves the stage area and the other houses the technical, backend equipment required for the AV systems to function.

For audio and video capture, Shure handheld and lapel microphones and camera points have been provided.

To ensure the auditorium is accessible to all, a Phonak hearing system has been deployed.

Heading to the Black Box, we find another LP Display LED videowall and the space is also Dolby Atmos-capable with Yamaha CL3 speakers.

A Blackmagic Atem 20 x 20 switcher for video streaming is provided. Shure microphones are used for audio pickup.

From the performance spaces, we head to the amphitheatre and larger spaces that offer an option for hybrid use, toeing the line between events and learning spaces.

LP Display LED videowalls with Magnimage controllers serve

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>
> *Nigil Antony, Global Schools Foundation*

We are running 10Gb on the edge even though most end user devices remain 1Gb. But again, this is a decision which we feel makes us future ready.

Nigil Antony, Global Schools Foundation

as the display. Yamaha ceiling speakers are being used for audio.

Clear-Com wireless intercom system with belt packs have been provided so that operations across the spaces can run smoothly.

Befitting their status as modern teaching and learning spaces, AV over IP is used for signal transport with ZeeVee AV-over-IP encoders and decoders being pressed into action across the OWIS campus.

Antony says: "Everything is AV over IP. We're using Dante for audio transmission, and we are using ZeeVee encoders and decoders for video transmission over the network. Again, this decision was motivated by multiple factors one of them being use case scenarios. We create content in-house, we stream content, and one of the things we wanted was to make sure was that every video feed from the campus was available to the editors for their sessions and the best way to establish that was with AV over IP."

The groundwork to shift to AV over IP was laid early as Antony continues: "We planned for AV over IP early. in 2016, when we were designing the campus network, we went with Cisco Nexus and a 40Gb backbone. And this meant that when the time came for AV over IP, our core was able to support it. We are running 10Gb on the edge even though most end-user devices remain 1Gb. But again, this is a decision which we feel makes us future ready."

Whenever AV and IT come together, there are some teething problems and ESCO handled these with aplomb. Ratheesh expands: "We're using ZeeVee encoders and decoders with Aruba switchers. The end user supplied the network switches, and we had never worked with this combination of products before. Initially we had hiccups with the devices not connecting to the network. We received tech support from both Aruba and ZeeVee and we worked towards a solution. We solved the issues by changing from static IPs to DHCP which rectified the issues we were facing."

AV over IP serves the critical function of connecting all the spaces at OWIS together, allowing them to become spillover rooms when needed. Wall and floor plates provide AV-over-IP connectivity in the spaces and furthermore, Zoom is integrated into the technology systems to provide conferencing.

In the seminar rooms, where most of the teaching and learning happens, LP Display LED videowalls serve as the main display measuring in at 3.36m-wide and 1.92m-high. LED tiles with a pixel pitch of 1.5mm have been used. OWIS wanted to ensure a premium experience, and having a large, bright, easily seen display was a central component of creating the desired outcome.

Keeping in line with delivering a premium experience, Shure speakers and four Shure MXA920 ceiling microphones comprise the audio system. The density of ceiling microphones ensures that audio from every student and teacher in the space is effectively picked up.

Antony explains why the Shure ceiling microphones are an essential component of the learning spaces: "The use case for voice lift came from what we call 'student exchange'. We not only have multiple campuses in

Tech Spec

Audio
Biamp Vocia DSP, speakers

Clear-Com intercom system

Nexo amplifiers, DSP

Shure MXA920 microphones, speakers

Yamaha AOC 4, CL3 speakers, AFC system

Video
Aruba network switches

Blackmagic Atem 20 x 20 switcher

Elmo interactive displays

LP Display 1.5mm, 2.5mm LED tiles

M Fusion PCs

Magnimage controllers

Philips flat panel displays

Poly X52 videobar

ZeeVee AV-over-IP encoders and decoders

Control
Crestron control processors

Singapore but also around the world and we have sessions with teachers, instructors, and up to 160 students where they come and connect with all the other campuses via technology to expand their horizons and learn. What we found was that when we ran these student exchange sessions, we needed five or six volunteers to just move around with microphones which was not a great experience. And we found that this mode was hampering organic discussion and participation. On top of that, the trainers themselves were not completely proficient with AV tech, and we found that handheld microphones being passed around didn't accurately capture their voice. And when we looked at this, we realised that voice lift could just solve all these problems and create a much better experience for everyone. There are disadvantages with voice lift, such as privacy, but in our sessions, we can manage this easily so it was the perfect solution for us."

A Crestron control system and PC running the management software from ZeeVee and the other OEMs provide oversight over the technology. Control and remote management were core requirements and Antony elaborates: "In Singapore, manpower comes at a premium. So, during the design phase, if we could find a way to automate processes we automated. We have a team of four professionals that manage this entire campus, so ensuring that everything was manageable was crucial for us."

Evidence of a thoughtful and considered approach to technology can also be found across the various other spaces of OWIS.

In the cafeteria for example, background music is provided with a Biamp Vocia DSP and the digital signage system comprises Philips monitors and the M Fusion software for content management. Together the two systems ensure that users in the space can interact with each other while also receiving messaging and essential information.

Elmo interactive flat panels have been deployed in kindergarten classrooms to provide a level of interactivity and enable a sense of play. The software for these interactive panels has been customised to OWIS's requirements and the needs of the space, an example being the integration of Zoom.

Lastly, in the outdoor spaces such as the field, Biamp speakers that are able to withstand the elements have been deployed.

Antony sums up the project and explains how all parties worked together to create the experience at OWIS: "We initially planned for this project to take 18 months, but it was actually completed somewhere around the 24-month mark. And the delays meant that we had to worth together with ESCO, our last mile partner, to make sure that the project was completed to the level we wanted. The delays caused some interesting ripple effects some of them positive due to ESCO's commitment to delivering excellent service. For example, we had specified the Poly X50 videobar for our meeting spaces and as the project got delayed the X52 was released. ESCO was able to upgrade the model for us as not extra charge which meant that we ended up with the latest product on the market despite delays."