



The Yale-NUS campus as seen from the air

Community collaboration

Just as Singapore's Yale-NUS College is steadily growing, so its A/V systems have become more impressive, as **Richard Lawn** reports

TODAY, SINGAPORE CAN BOAST SOME of the highest academic centres of learning in the world. In 2011, the island's enviable framework of educational institutions added a collaboration between the National University of Singapore (NUS) and Yale University in the USA to its portfolio. Yale-NUS College became the first liberal arts college to open in the Lion State, aiming to increase its population to 1,000 students and over 100 teachers by 2017. As such, the institution turned to Arup Acoustics to design and implement a hybrid network combining A/V riding over IT to the multiple performance venues and academic facilities.

At the heart of each residential college, dining rooms allow students to eat together, share ideas, debate differences and develop friendships. Architecturally distinctive and purposefully designed buildings encourage community life and student engagement – both central to how today's theme of collaboration is put into practice. Located in Dover Road, adjacent to NUS University Town, the 63,000 sq-m eco-campus integrates a performance hall and a black box theatre in addition to dining halls, a sports hall, a 75-seat capacity lecture theatre, 60-seat capacity seminar room, classrooms and VC rooms.

Painted on a central wall on the Yale-NUS grounds, the college's motto is *A community of learning, founded by two great universities, in Asia, for the world*. For the four systems integrators who fulfilled the stage engineering (Siong Ann Engineering), production lighting (Desisti Asia), audio and communications (Electronics & Engineering) and A/V (Quantum Automation) contracts, the project was also an educational experience. The performance venues at Yale-NUS have been designed to complement neighbouring NUS' UCC rather



Yale NUS's Nabila Abu Talib (executive, Arts Programmes), Gurjeet Singh (senior manager, Arts & Media) and Md Shafei bin Seri (technical manager, Arts & Media) with Arup theatre consultant Tan Suan Wee

than compete with them, so the black box theatre and performance hall attract different productions and audiences.

The black box theatre can be used to host any manner of broadcast-quality theatrical, dance, film or musical performance within its 185-capacity shell. Perhaps the only limiting factor – in addition to storage space – is a lack of creativity. The back of house area serving it is adorned with a workshop, dressing rooms, a loading bay and seamstress / fabrication studio. Within its 256 sq-m walls, clip rails can be used for numerous tasks, whilst an overhead high tension grid, lighting bars and chain hoists allow technicians to recreate lighting and audio configurations as required. Arup Acoustics was made aware of

a growing trend in venue design – a lack of manpower resources. As such, the remote controllable retractable seats were installed for ease of implementation in addition to flexibility.

Performances are mixed on a Yamaha CL3 digital console and reinforced on Meyer Sound UPQ speakers affixed above the grid. Four channels of Shure ULPX4 wireless microphones are available for which SM58 handhelds, head-worn and clip-on mics can be adopted by performers, who can monitor



Tan Chin Tuan's motto takes central positioning in the 339-seat Performance Hall



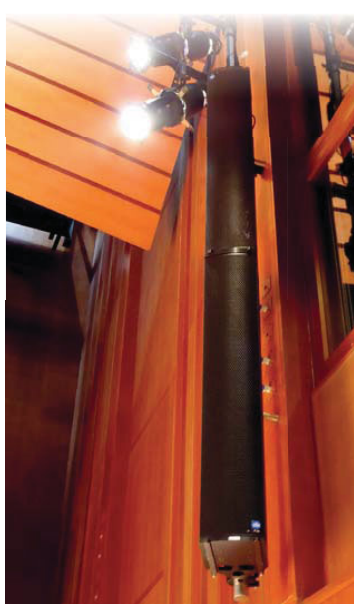
Meyer Sound UPQ speakers are affixed above the grid in the Black Box Theatre

themselves from Nexo PS10 and PS15 speakers. In addition, Meyer Sound UP-Junior speakers can be set up for events that require surround sound. Whilst XTA DP448 processors allow the operators to configure the DSP on stage, a Q-Sys Core 500 processor provides back of house DSP such as show relay and paging. Clear-Com Helixnet communications enable back of house instructions to be relayed to technicians on HMS-4X headsets during performances. Video production has been enabled with the introduction of Ross HDMI fibre backbone screening inputs onto a Panasonic PT-DZ10KE projector.

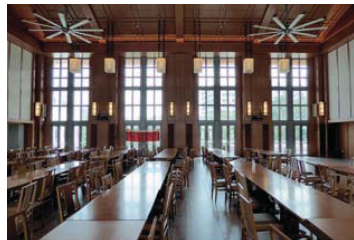
The 339-capacity performance hall is acoustically stunning with rich hardwood floors, walls and furnishings all providing natural amplification for string quartets, piano concertos and acoustic guitar performances. Gentle amplification for speeches and other music can draw upon a pair of Renkus Heinz IC Live speakers discretely affixed to the lateral walls, whilst a Nexo M8 line array is hidden away above the acoustic panels until called upon. A Yamaha CL3 console has been installed in the rear control room together with four channels of Shure ULPX4 wireless.

'You don't need to see them unless they're in use,' explains Arup Acoustics' Suan Wee Tan. 'Yale-NUS asked for intimacy, inspiration and a sense of arrival in this venue and this has been achieved from the moment you are greeted by fountains at the entrance. You don't need much amplification in here and like the black box it takes into consideration the low technician count on site.' As such, AMX touch panels programmed by E&E together with iOS control have been integrated allowing lecturers to configure their own audio, video and lighting, but they can call upon a technician should they require support. In addition, the technical personnel here – including Gurjeet Singh and Shafei Mohammed Bin Seri – are all thoroughly professional. They would prefer to concentrate on each and every eventuality of the performance rather than becoming bogged down with the mundane day-to-day tasks.'

The campus beyond the arts venues encourages the students to host their own performances without technical assistance whilst empowering the lecturers and teachers to utilise A/V technology to enhance the educational experience. A Crestron CP3 system lies at the core of the academic spaces, for which remote control and wall mounted touch-panels can be used for accessing various sources such as laptops and PCs in addition to audio levels. Learning sources can be integrated wirelessly via VEOS Collabor8 software. 'The Collabor8 software simplifies the classes as it allows the teacher to share the content from his device. However,



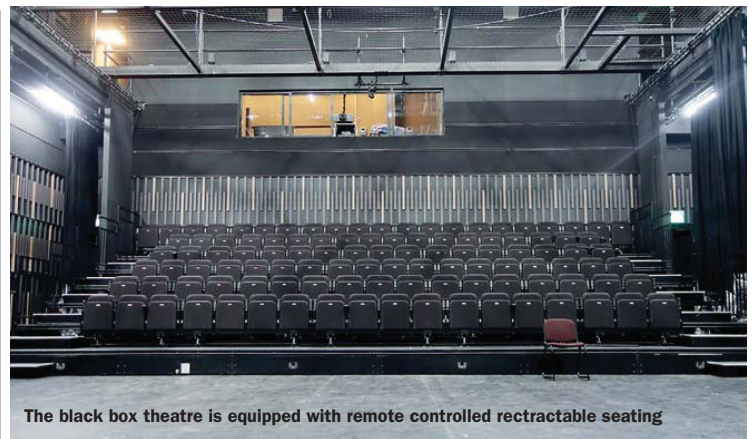
Two Renkus Heinz IC Live speakers provide speech intelligibility in the Performance Hall



Four wall-mounted Fohhn Linea LX150 column speakers provide BGM and announcements in the two large Japanese-designed dining rooms



Crestron CP3 remote control and wall mounted touch-panels can be used for accessing various sources such as laptops and PCs in addition to audio levels



The black box theatre is equipped with remote controlled retractable seating

wired connections are available throughout for redundancy and security purposes, should the Wi-Fi fail or a subject matter be deemed controversial for sharing beyond the confines of the room.'

Designed to encourage interaction and dialogue, LT-60 resembles a parliamentary chamber in which three curved rows of seats are banked in terraces so that the students' views are not restricted. Three NEC NP PX750UG projectors and motorised Remaco screens receive their video signals from a Crestron DM1616 matrix whose inputs include Sony cameras, Blu-Ray players and PCs, whilst video conferencing and surround sound is managed by a BSS BLU-160 processor. Discretely hidden JBL Control speakers are powered by QSC CX404 amplifiers and the system is powered on and off by two Furman DN-3600SE sequencers. Even coverage from concealed speaker systems is repeated in LT-75 where an EAW DSA column solution has been integrated behind wall fabrics, whilst the two large dining rooms are catered for by four wall-mounted Fohhn Linea LX150 columns.

'There is a lot of data riding over the IT infrastructure,' confirms Mr Tan. The EVL rooms are connected to the building management server, so that the digital signage for the

classrooms can be controlled automatically. The signage, air conditioning, lighting and other functions are turned on in sequence prior to a scheduled event such as a lecture. Collaboration is no longer a theme as these diverse rooms now aptly demonstrate.' The internet of things has duly arrived whereby discrete, user friendly operations are now enhancing and stimulating a community of learning and entertainment practices behind eco-friendly facades.

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The three NEC NP PX750UG projectors and motorised Remaco screens in LT-60 receive their video signals from a Crestron DM1616 matrix whose inputs include Sony cameras, Blu-Ray players and PCs

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