Qatar Science & Technology Park, Hamad Medical Corporation and Weill Cornell Medical College in Oatar have collaborated with academics and surgeons from Imperial College London to form the Qatar Robotic Surgery Centre (QRSC). Technomight has provided the AV solution.

Robotic surgery, a reality:



he new Qatar Robotic Surgery Centre aims to advance healthcare research in both the UK and Qatar, and become a focal point for world-class expertise in the fast-growing field of medical robotics and robotic surgery.

The centre will provide a platform for technological development of medical robotics and promote clinical application of the technology in the Middle East, acting as a demonstration platform for advanced surgical technologies with state-of-the-art equipment, laparoscopic simulators and 3D tele-cast capabilities. QRSC will also offer a broad range of robotic training

programmes for surgeons, healthcare professionals and scientists, and stimulate technology development in medical robotics.

The Centre will incorporate live demonstrations as well as live-link training sessions, promoting the transfer of expertise between Imperial College in the UK and

Tasked with delivering this virtual reality environment was Technomight, which has developed extensive experience in 3D environments - particularly in the gas and oil drilling sectors, working for multinationals to develop simulation environments.

Having proved their ability to deliver turnkey systems

in several major projects in Qatar they were invited by M/s DEPA a reputed interior fit out company to participate in the tender process of Qatar Foundation, who are tasked with making Qatar a leader in innovative education and research.

"Some companies from the region participated and some international firms," said Ahmed H. Sayeed, Technomight's founder, "but because of our local presence and our track record, and the fact that we had been involved in at least four previous 3D integrations in the gulf region, we had a major advantage."

This was no mean feat as the project was destined to become the first facility of its type in the Middle East -

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iberTechnology: DisplayPort, HDMI or DVI signals are transmitted over one multimode cat5 cable eliminates the need for copper connections and provides total galvanic HDCP handshaking, RS-232 and USB connectivity is also available and transmitted the same single fiber.

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ime delay: No delay occurs in the signal during optical conversion, the video image is rted without any frame latency.

When you have no



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and possibly the largest robotic surgery centre in the world.

"We had guidelines provided by the Imperial College London, but with help from our suppliers we were able to propose a higher-grade system that was accepted by the client. Primarily they wanted broadcast standard facilities – with the highest possible signal quality – HD-SDI."

Christie's EMEA sales director, Simon Smith who was involved in the consultation said, "Aside from consulting on the correct choice of projector, we advised on source routing and various other technical issues, including, projector set-up and final commissioning."

Essentially the facility consists of two active 3D theatres and a tele-mentoring room. The main active 3D theatre contains a Christie Mirage HD6 6000 ANSI lumens HD 3D projector, with active stereo capability,

firing onto a 2815mm \times 1454mm curved screen via an HD projection zoom lens 1.4–1.8:1 HD (SXGA+ 1/5–2:1) and using the Twist module. The screens are painted with high gain acrylic emulsion to achieve the optimum brightness.

The second robotics theatre has a similar specification, although the screen measures a smaller 2393mm x 1454mm.

Either side of each screen are mounted Samsung 46" full HD LCD panels which can accept sources from the matrix – these include feeds from the Sony VC units or from the robot cameras themselves.

Operating in active 3D, the projectors themselves are mounted in specially built enclosures in the ceiling (not visible from the outside). Up to 20 trainees can be immersed in either of the two environments. A special Lightspeed Design passive to active converter includes

DepthQ*Capture and DepthQ*Player for high definition stereoscopic media. DepthQ Capture also allows the recording of procedures onto a local PC hard driver for later playback and learning.

The room occupants wear active LCD shutter glasses from Real D CrystalEyes eyewear and; the eye glass shutters are synced in high speed by a long range wide angle IR emitter in the ceiling, which in turn is synced by the projectors.

The left and right images from the Da-Vinci Robots are first fed into the Leonardo servers which then output a HD-SDI signal through an Extron HDXP 1616 Matrix switcher into the Depth Q system which resides on a Super Micro Super Chassis SC 743 incorporating NVIDIA Quadro FX 3700 single graphics cards. The Depth Q system converts the passive left and right image signals into an active signal in the DVI format.

ime frames to lose



HDMI-OPT series



DP-OPT series





DVI-OPT 110 series: DVI connector sized extenders with several status LED aluminum casing with advanced ESD protection and stable SC connectors.

DVI-OPT 220 series: Professional DVI extender with Optical CON fiber connectors a Accurate Reclocking. Local monitor output on transmitter and dual output on receive

HDMI-OPT series: HDMI 1.3a extension with HDCP and bi-directional RS-23 through. Advanced EDID Management, Pixel Accurate Reclocking. Dual output monitor output on transmitter and dual output on receiver).

DP-OPT series: Dual-mode DisplayPort extenders handling resolutions up to 256 Plug and play operation with several status LEDs. Other signals – for instance to the plasma displays located either side of the projection surfaces – are supplied over further Extron signal extenders, this time UTP-based.

Signal scaling is performed by Extron Annotator

scaler units, which have the added benefit of allowing a lecturer to annotate any of the displays in use.

The theatres are to be used primarily for training purposes, each connected via a high bandwidth Sony HD video conferencing system, operable in three different modes.

Jan Nuyens, head of the QRSC explains, "The theatres can be used as

66 Because of our local presence and track record [in implementing several successful 3D projects] we had a major advantage.

immersive 3D sessions where students/trainees are present, while live surgery from anywhere in the world can be screened live into the QRSC facility. Alternatively a surgeon can perform simulated surgery, which students can witness in 3D. And finally students can perform in the Doha theatres on a plastic dummy while expert surgeons can guide them from a remote location."

The tele-monitoring room acts as an additional space for learning. Students can watch remotely procedures from either theatre, or participate in a remote lecture via the Sony VC system.

Audio reproduction is provided either through the speakers built into the Samsung displays, or alternatively via a 4-channel infra red distribution system from Listen Technologies. In this case each student is provided with a headset.

"As a Systems Integrator, Technomight have done an excellent job in professionally implementing these complex systems" says Jan Nuyens, "Right from participating in design meetings with the experts from Imperial College to coordinating with the Centre to understand the requirements and to finally come up with innovative and cutting edge solutions that address all the high-tech needs of the Centre, Technomight have worked hard and the results speak for themselves"

"Seeing is believing, this is Cutting Edge, literally", says Ahmed H. Sayeed. "As a result QRSC has really become a showcase of technology for the centre and is almost constantly busy with a steady stream of local as well as foreign dignitaries interested in experiencing the region's much talked about facility with technology straight out of a science fiction book." Θ

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nsung Full HD 46" LCD panels y PCS HD Video Conferencing

