Augmented and Virtual Reality Make Inroads in Asia Medtech Market

Digital reality technologies are fast emerging as promising tools to aid physicians and patients. Western and Asian medtech companies are becoming big players in the growing market for these new applications in Asia.

How are Augmented and Virtual Reality Technologies Used in Healthcare?

Augmented reality (AR) superimposes computer-generated images, sounds, or other sensory experiences on a user's view of the real world. Virtual reality (VR) takes the experience further by using computer technology to immerse the user in a simulated three-dimensional environment, creating the impression of experiencing the artificial reality firsthand.

The companion technologies, first developed for video games, are poised to disrupt the healthcare industry and change the landscape of the medical field. Harnessing the powers of technology and human imagination, they are beginning to make it possible to simulate surgery, enhance diagnostic imaging, and improve patient care management and rehabilitation.

In medical training, for example, virtual reality developers envision physicians donning VR headsets and masks to simulate performing complicated surgical procedures with great precision. The technology, it is hoped, could also allow medical professionals to gain an enhanced understanding of anatomy and physiology.

In actual surgeries, a physician might employ augmented reality technology to simplify complex surgeries. For example, while a surgeon today might have an MRI or CT scan available to consult during surgery, AR could allow the surgeon to layer virtual three dimensional images of those same scans over their view of a patient's vessels, organs, or nerves. By enhancing the precision of a surgeon's view, AR could reduce surgical complications.

For patients suffering from physical pain, virtual reality could be a game changer. A study conducted by the Cedars-Sinai Medical Center in Los Angeles found that patients who wore VR headsets and immersed themselves in calming videos or imagery of swimming in the ocean reduced pain scores by 24%. In comparison, patients who watched similar calming videos in a two dimensional view reduced their pain scores by only 13%.

Virtual reality is also increasingly being used to aid patients recovering from psychological trauma. At the Institute for Creative Technologies at the University of Southern California, patients with post-traumatic stress disorder (PTSD) are using the technology to simulate traumatic situations and better understand how to cope with triggers. In London, clinicians at King's College Clinical Research Facility are adopting VR simulations to treat patients with bipolar disorder, psychosis, and schizophrenia.

Virtual and Augmented Reality Technologies Take Hold in Asian Markets

While the United States is a leader in the use of digital reality applications, manufacturers are increasingly exporting them to Asian markets. And Asian competitors are not far behind.

Microsoft launched HoloLens, an augmented reality device it describes as mixed reality smart glasses, in China in May 2017. Developed a few years earlier as a video gaming device, Microsoft is marketing HoloLens in China as a way to help medical students use digital content to learn anatomy and to help doctors come up with surgery plans. While Microsoft has not revealed its first year sales of the device, HoloLens Strategic Director Jared Anderson says it is already being used in more than 100 top tier hospitals in China for designing surgical plans, conducting medical training, and navigating surgeries.

In January, surgeons operating at Bortala People's Hospital in Xinjiang used the technology to consult remotely with colleagues at Wuhan Union Hospital in Wuhan, China and at Virginia Polytechnic Institute and Virginia State University in Blacksburg, Virginia. Donning the HoloLens device, physicians at the three remote locations were able to simultaneously view the patient's MRI and CT scans in 3D. Using what they saw, they were able to offer guidance to the surgeons in the operating room in real time.

In 2016, Taiwanese smartphone manufacturer HTC entered the field with the HTC Vive, a virtual reality device. Since then, the device has been used for surgery simulation and medical training around the world. At New York University, the University of California San Francisco, and Penn State University, students use HTC Vive along with VR anatomy software produced by Australia's Medis Media to study human anatomy. HTC Vive also partners with SimforHealth, a VR surgical simulation firm in Bordeaux, France, to train over 30,000 medical personnel around the world. Working with Surgical Theater, a Mayfield, Ohio virtual reality medical visualization platform, HTC has developed a neuroimaging VR application to help neurosurgeons prepare for complex surgeries.

South Korean multinational conglomerate Samsung is also getting in on the fast moving virtual and augmented reality healthcare market. In September 2017, Samsung announced it is developing a new application of its VR headset, the Gear VR, to enable doctors to better diagnose some forms of mental illness. Developed in partnership with Gangnam Severance Hospital in Seoul and South Korean software firm FNI, the application will use cognitive behavior therapies to improve psychological assessments. In March, Samsung announced it is working with researchers at New York's Cedars-Sinai Medical Center, German pharmaceutical giant Bayer, and Los Angeles company AppliedVR to develop methods to use the new technologies to reduce pain during, and speed recovery after, orthopedic surgeries.

In Zurich, Switzerland, Limbic Life, Ltd. has paired its Limbic Chair, used by rehabilitation patients, with the Samsung Gear VR in a research project to explore how the two products, employed together, could offer movement and task-functional games to help patients recover with greater ease.

In Japan, Tokyo-based startup HoloEyes secured $1.3 million in Series A financing in June 2017 for its app that converts two dimensional CT and MRI scans into 3D images for use in virtual reality platforms. The technology has already been used in about 50 surgeries in Japan, according to company officials.

The up and coming virtual and augmented reality technologies hold significant promise in the medical field. Fast evolving, the technologies are being harnessed by major players in the medtech industry and smaller startups alike to provide new ways for patients to manage pain, recover from injuries, and deal with mental illness. Asian and Western medtech companies are making the Asian region an important front in the development of the AR and VR market.