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TECHNOLOGY

Virtual Reality Finally Catches On— With Businesses

While consumer sales remain low, industries from construction to medicine are using the technology to train for risky jobs

By Betsy Morris

June 5, 2017 8:00 a.m. ET

Gary Steinberg, Stanford University's head of neurosurgery, has been operating on brains for more than three decades. Only in the past year has he been able to do something that he says gives him a significant advantage: preview the surgery and practice it.

Donning a virtual-reality headset, the 64-year-old works through thickets of digital blood vessels in a precise computer simulation of a patient's gray matter before he cuts into the real thing.

"I can figure out how best to approach a tumor and practice it so that when I get into the operation, it's as if I've been there before," Dr. Steinberg said. "It makes surgeries safer. Outcomes are better."

Virtual Reality, or VR, has been slow to catch on with consumers, despite the high-profile launches last year of headsets from Facebook Inc.'s Oculus unit and Taiwan's HTC Corp.

But businesses are taking to it for training in industries from construction to medicine to sports. Executives say customized software that works like 360-degree videogames can help teach employees more effectively, less expensively, and often more safely than traditional methods. Wal-Mart Stores Inc., for example, last week said it will expand VR training to all of its 200 employee training centers this year, after testing it in 31 centers. It plans to make the technology an integral part of training for 140,000 employees annually, said Tom Ward, a Wal-Mart vice president.



REACH OUT AND TOUCH SOMEONE: Haptic technology, which re-creates the sense of touch, being tested on a dental-training device at a U.K. conference in April. PHOTO: CHRIS RATCLIFFE/BLOOMBERG NEWS

And while they are pricey for many consumers, VR headsets have become affordable for most businesses: the upmarket HTC Vive VR system sells for about \$800.

Research firm International Data Corp. estimates total shipments of headsets for VR and augmented reality—a related technology that superimposes digital content onto a user's view of the real world—will grow at a compounded annual rate of 58% over the next five years. Business demand will be the main driver, with shipments of headsets for commercial growing 80% a year, versus 50% for headsets for consumers, says IDC.

VR training is so new that there has been limited ability to measure its effectiveness as a business tool, and it has shortcomings. Some people feel awkward putting on the headsets, and some experience motion sickness. VR doesn't lend itself to training for jobs that require manual dexterity, for example—in the virtual world, you're rarely able to see your hands.

Still, United Rentals Inc. is a believer. The company, which rents generators, backhoes and thousands of other types of equipment, has been testing VR training since December for new sales staff. Instead of giving lectures and showing pictures of construction sites, “we bring the job site into the classroom,” says Patrick Barrett, director of training and development.

In its VR training, employees stand on the edge of a virtual construction site, with two minutes to observe and determine what equipment is missing before an avatar of a construction boss approaches and they have to begin their pitch.

“Do they see that excavation—a hole in the ground, filled with water; do they see that opportunity to rent that customer a pump?” asks Mr. Barrett. He predicts it will shorten his weeklong training program by half, and is planning to expand the VR training beyond the new hires.

At Wal-Mart, trainees scan VR produce and deli sections to spot problems like a missing price on the broccoli or a worker who forgets to ask how thick a customer wants the turkey sliced. They also get a virtual preview of a Wal-Mart on one of its busiest holiday shopping days when crowds flood the stores looking for deals. For trainees, “one minute it's 85 degrees outside, the next, you are in the middle of a Wal-Mart Supercenter during peak period,” said Mr. Ward. “If you're new to Wal-Mart, it would be difficult to prepare you for that” without VR.

JLG Industries, a unit of Oshkosh Corp. , says VR is a safer and more efficient way to train operators of its boom lifts, who must learn to operate the vehicles from platforms extended up to 185 feet off the ground on giant arms. JLG's training-system simulator, built by San Francisco-based ForgeFx Simulations, is networked so that multiple trainees across the globe can operate virtual machines in the same 3-D construction site—all without leaving the ground. “Hands down, it's much safer than a real machine,” says Rick Smith, senior director of JLG's global product training.



Virtual Reality has been slow to catch on with consumers. Above, a man samples VR goggles during the CES tech show in Las Vegas in January. PHOTO: AFP/GETTY IMAGES

JLG says it plans to begin marketing the training programs as soon as July to as many as 50 customers who have asked for it.

The National Football League has found VR training so versatile it has taken a stake in Silicon Valley-based startup Strivr Labs, which designed the programs for Wal-Mart and United Rentals. At the NFL, its software will be used to train players and officials. Strivr also has developed a virtual-reality interview simulator for general managers to practice interviews with prospective players. The practice is designed to hone questions to find the right candidates and also to eliminate some of the implicit bias that's stirred anger in the past. By studying virtual interviews as if they were field plays, general managers can learn to steer clear of off-limit topics like one's race or sexual orientation.

The use of VR is spreading especially quickly through medicine. VR 3-D modeling of the brain developed by Surgical Theater LLC is already being used for planning and practicing neurosurgeries in hospitals at New York University, University Hospitals in Cleveland and Mount Sinai among others.

A clinical study published last year in the Journal of Neurosurgery found that preoperative practice with Surgical Theater's rehearsal platform reduced the time it took to repair aneurysms, which suggests it also made the surgeries safer.

Meanwhile, at Johns Hopkins University, orthopedic surgeons are developing a way to use augmented reality to superimpose patients' X-rays onto the inside of goggle lenses. This would allow the surgeons to refer to the X-rays as they repair complicated pelvic fractures.

Stanford's Dr. Steinberg calls the emerging new technologies "transformative." "This is potentially going to be the future in how we engage patients, operate and train the next generation of neurosurgeons," he said.

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Appeared in the June 6, 2017, print edition as 'Real World Is Finding New Uses for Virtual Reality.'

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