

Medical devices child's play

Innovations derived from video games may one day be used for life-and-death situations in reality

BY JON VAN

January 14, 2007

For the latest ideas in form and function, the medical technology designers at GE Healthcare don't necessarily need to tap into their research and development department.

Instead, they check out the latest PlayStation , Xbox and Wii video game gizmos.

"We're riding right on the backs of consumer electronics," said William "Bill" Clarke, GE Healthcare's executive vice president and chief technology and medical officer.

Clarke credited the Sony PlayStation's "small and functional video chips" with enabling GE to produce a laptop-size ultrasound machine.

This allows it to be taken to the delivery room rather than having to truck an expectant mother to an imaging room equipped with a 300-pound ultrasound machine. The goal for GE Healthcare, which operates out of offices in Barrington, is an even smaller, hand-held ultrasound device.

Combining technologies

To push such product concepts, GE created the position of "disruptive technologies marketing manager."

The job was created after "an aha moment by GE Healthcare executives who decided we needed somebody who's not an engineer to take a somewhat less-scientific approach, to think outside the box," said Brandon Savage, general manager of global marketing for the firm's integrated IT solutions.

"One thing we realized is that if you want to change the market in a revolutionary way, you must combine technologies that historically never touched each other," said Savage. "Two different industries come together, and you get this bright idea."

Companies traditionally have looked within their own industries to find new technology, said David Smith, vice president with Austin-based Technology Futures Inc., a research and consulting firm.

"The trend now is to look horizontally," Smith said. "Competition is forcing this because product development times are shortening, research time is shortening. Even the government and defense rides on the back of the gaming industry today."

Smith said that GE and Boeing Co. are among the firms leading this trend of collaboration among unrelated industries.

"Everything is digitized now," he said. "You get this horizontal digital convergence. Take elements from different industries, combine them in new ways to get a hybrid, a new industry different from either its parents."

Mark Morita, GE Healthcare's disruptive technologies marketing manager, said he routinely scouts the shows where video gamers show off their hottest stuff and attended this month's Consumer Electronics Show in Las Vegas. He also reads gamer blogs and meets with his counterparts at Microsoft, Sony, Mitsubishi and other electronics concerns to exchange ideas and gadgets.

"My whole job exists because of the rise of the video gaming industry," Morita said.

And just as the latest video games, the latest medical equipment, GE thinks, needs to be as simple and intuitive as possible.

"The Xbox or MP3 players are designed so that anyone using any language can run them," said Terri Bresenhan, general manager of GE's diagnostic ultrasound and information technology business. "We're keen on going from having a highly skilled person operating a machine to something more intuitive that can be run by people with a variety of skill levels."

In their quest to make video games easier and more exciting to use, designers have moved away from traditional mouse or toggle controls. Today's gamers may wave their arms in the air, run their fingers across a board or use a closed palm to control various devices.

Such innovations should help users avoid repetitive stress injuries and hold promise for use by physicians, said Morita.

In his Barrington office, Morita has rigged up a unit where a surgeon can control screen images either by speaking into a microphone or by waving his hands at cameras above the display.

"In the operating room, the surgeon is scrubbed and sterile," said Morita. "If he needs to consult an image while operating, he needs to control the display without touching anything that might contaminate his hands."

Another prototype borrows from a large light table game from Mitsubishi where the object is to pop the most colored bubbles of light before they disappear.

Morita modified the light table so that a health-care team could use it to view a patient's medical records--including high-definition images of their CT scans, colonoscopies and electrocardiograms--and exchange views while planning a course of treatment.

Demonstrating prototypes

In this scenario, patients would carry their own medical histories in electronic memory sticks that could be plugged into display devices. Health-care providers could make annotations and add information to the record.

GE Healthcare representatives use the prototypes to show new technologies to academic medical researchers and other physicians, seeking feedback.

Morita said the company intends to have some of the devices ready for market in three to five years.

Another GE Healthcare prototype is based on the futuristic display in the movie "Minority Report." Users of the new display would seemingly pluck information out of the air, placing it on a transparent screen.

Such a display, Morita said, might have great advantages for medical classes.

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