



Top 5 Innovators: Forging a connection

When Korean-born engineer Sokwoo Rhee couldn't find the right wireless network to power a small invention, he made his own.

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Four years ago, Sokwoo Rhee, then a doctoral student at the Massachusetts Institute of Technology (MIT), picked up a ring – and it led to an adventure. The biomedical ring sensor, invented by Mr. Rhee's MIT advisors, reads vital patient stats for oxygen, temperature, and heart rate. The Korean-born scholar was fascinated, but frustrated with the device's drastically limited battery power.

"I knew that if I wanted to go any further with the sensor, I had to build some kind of communication network," says the chatty Mr. Rhee, 34. "Nothing that satisfied my requirements existed at that point, so I decided to build my own." In 2001, a year after graduating from MIT, he founded Millennial Net with MIT faculty member Sheng Liu, who now heads the research department.

Mr. Rhee and his colleagues spent many nights in a tiny Cambridge, Massachusetts, office, playing with the building blocks of the wireless world. The company soon launched the iBean, a low-powered, efficient wireless scheme for sending and receiving signals that typically drain battery power. Today, iBean powers hundreds of devices, and has already received national attention for its uses.

Mr. Rhee's iBean is the Swiss Army knife of wireless mesh networking schemes. It works with all types of environments, and power and distance constraints. Small, quarter-sized, low-cost sensors relay data on temperature and other conditions to a central control system, which can, in response, take action. The innovation has a far reach: it could help farmers treat their crops, monitor a home's temperature and humidity, or be used in affordable blood pressure-monitoring instruments.

Mr. Rhee has always had a passion for what he calls "computer-related stuff." The Seoul, Korea, native left his home country at 25 and came to the United States to pursue his master's degree in mechanical engineering at MIT.

By 2002, Mr. Rhee was satisfied with the iBean as a product, and began to focus on the business side. He made himself chief technology officer of the company, and appointed Andy May, a former executive at 3Com and CompuServ, as CEO.

Boo-Ho Yang, Mr. Rhee's co-advisor at MIT, says that Mr. Rhee's real innovation is his imagination. "I'd say his theory isn't rocket science, but the implementation of the product is key," Mr. Yang says of his protégé. "They aren't the first people to work on this product, but one of the first to deploy to the products and make a mass need for the product." The Burlington, Massachusetts-based company – which focuses on OEM – has done well. Mr. Rhee won't confirm what the company's revenue is, but says that the revenue in 2004 has grown seven times from 2003 and he expects the company will break even next year. It has hundreds of customers from all over the world.

Venture capitalists have also been keen on the company. To date, Millennial Net has raised \$21 million primarily from four venture capitalists including Kodiak, General Catalyst, Globespan, and Bell Canada Enterprise. The company now has 45 full-time employees, and will expand to 50 by the end of the year. Mr. Rhee says that the wireless sensor networking industry is still in its infancy stages, but has big potential. In 2004, the research firm ON World estimated that wireless sensor networks generated less than \$150 million in sales last year, but will be at \$7 billion by 2010.

Who: Sokwoo Rhee

From: Korea

Education: B.S. Mechanical Engineering, Seoul National University; M.S., Mechanical Engineering, Massachusetts Institute of Technology; Ph.D., Mechanical Engineering, MIT.

Innovation: Developed efficiently powered and portable wireless sensor networks.

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“In 2000 no one knew what a sensor network was. I used to spend one and a half hours explaining [to potential customers and VCs] what it is, and we didn’t even have time to give a sales pitch,” he continues. “Four years later it is exploding.” He predicts that by 2007 millions of devices will operate under the wireless network.

Mr. Rhee spends the little downtime he has hitting the movie theaters, and watching science-fiction television. “I like watching ‘X-Men’ too, I’m a typical geek,” he says. He also is busy decorating his new house. As for the all-important iBean installation, “I physically didn’t have time to do it yet, but I’m thinking about it.”

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