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Hard-driving valley began 50 years ago
And most other forms of data storage
eventually became a distant memory
- Dan Fost, Chronicle Staff Writer
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The silicon chip gets all the attention. The valley is even named after it. But none of the
computer revolution would have been possible without the humble hard drive, which IBM
introduced to the world 50 years ago this week.

"It gets second shrift," said Al Hoagland, 79, who worked on the team of IBM engineers who
built the magnetic disk drives back when Silicon Valley was still mostly orchards. "The disk
drive is more important in revolutionizing society than most people are willing to say. With
everything shifting to an Internet-centered world and replacing papers, all the records and
anything we care about are stored on magnetic disks."

According to Bill Healy, senior vice president of corporate strategy and marketing at Hitachi,
which bought IBM's hard drive unit in 2003, "If you make a call on a phone, do an Internet
search or use a credit card, you are interacting with a storage device."

"Really, 'Storage Valley' would be a more appropriate name," Healy said, perhaps getting a little
carried away. "The semiconductor guys just had better marketing and public relations."

People in the industry love to talk about the way the hard drive has kept pace with, and even
drove, Silicon Valley's smaller-cheaper-faster mantra.

The amount of information stored on the modern hard drive is 100 million times greater than it
was 50 years ago, and the $30 billion industry is headed into a boom where users put ever more
data -- photos, songs, videos -- onto ever-smaller devices.

Dave Wickersham, chief operating officer for Seagate Technology, the world's largest maker of
disk drives, with headquarters in Scotts Valley (Santa Cruz County), compared the advancement
in disk drives with that in automobiles. A car in 1956 cost about $2,500, could hold five people,
weighed a ton, and could go as fast as 100 mph. If the auto industry had kept the same pace as
disk drives, a car today would cost less than $25, hold 160,000 people, weigh half a pound and
travel up to 940 mph.

It all started with an invention from IBM's research lab in San Jose, which the public caught its
first glimpse of on Sept. 13, 1956, when Big Blue unveiled its 305 RAMAC machine. It marked
the first time a computer had magnetic disk storage.
The historic date will be marked Tuesday at an invitation-only celebration at the Computer History Museum in Mountain View, and with events Wednesday and Thursday at DiskCon USA, the conference of the International Disk Drive Equipment and Materials Association (online at www.idema.org) at the Hyatt Regency Hotel and Santa Clara Convention Center.

Before IBM's breakthrough, computers relied on paper or magnetic tapes. The process was slow and cumbersome, as the machines had to read the paper or tape sequentially, instead of getting instant access to the information.

It's not as though the breakthrough made things any smaller. According to Hitachi's Healy, the RAMAC weighed a ton, was the size of a double refrigerator, and relied on 50 spinning platters. It cost $50,000, and held 5 MB of information -- roughly the equivalent of one song on a modern iPod. (A 60-GB iPod holds about 15,000 songs.)

The credit for the breakthrough generally goes to Reynold Johnson, who died in 1998 at age 92. Johnson, who earlier had invented the device used to grade multiple choice tests still in use today, was hired by IBM to establish a lab on the West Coast, which he did in 1952, when he opened a small office at 99 Notre Dame Ave. in San Jose.

"He had no idea of what he was going to do," said Hoagland, who left UC Berkeley to join Johnson's team. "The company had no idea. They didn't expect much out of him anyway."

Hoagland fell into his historic role as well. "I claim this, but I can't prove it: I drew the short straw," he said. As a grad student at Berkeley, most of the engineers wanted to work on logic design, and Hoagland wound up working on the memory.

He soon was doubling as a consultant to IBM, and in 1956, he joined Johnson's team full time.

"Rey was the kind of guy who, if you had a good idea, he would encourage you," Hoagland said. "He was one of these inventive creative visionary types who if he believed something, he didn't abandon it."

Johnson was awarded the National Medal of Technology in 1986 by President Ronald Reagan. Hoagland is now working to preserve the legacy by trying to get the boxy little white building at 99 Notre Dame Ave. turned into a museum.

The building, which has been declared a city landmark, is used by Santa Clara County Superior Court for child support cases, and Hoagland says it's likely to be vacated. "They have three full-time security guards for a couple of little courtrooms," he said.

He would rather see it turn into the Magnetic Disk Heritage Center. For the time being, he's working on getting the original RAMAC back into working order at the Computer History Museum in Mountain View.

"It's the biggest thing ever to occur in San Jose," Hoagland said proudly. "It preceded the semiconductor being out here."

Facts & figures

The first hard drive (RAMAC) -- delivered on Sept. 13, 1956 -- weighed 2,140 lbs and stored 5 megabytes of data.
Today, a video iPod weighs 5.5 ounces and holds up to 60 gigabytes.

In 1956, the RAMAC cost $50,000, or $10,000 per MB.

Today, a GB of storage on a 3.5-inch hard drive can cost less than 50 cents.

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