What's The Next "New New Thing?"

Silicon Valley's 'Best and Brightest' look hard into their crystal balls

"Old Silicon Valley Hand" and Focus's Ventures GP James Boettcher put it this way: "The bubble was of unprecedented proportions. It was matched and equaled only by the unprecedented collapse of the IT market and it entered into the nuclear winter we now find ourselves in."

But all winters end and viable ideas eventually germinate. But which ideas are more viable than others? Boettcher and four IT experts stood ready to answer the question – ready to ponder the future, the 'next new big thing' at *AVCJ*'s recently concluded AVF/USA in California.

James Boettcher

First, a backgrounder. The IT market is still unsettled, growth rates flat lining. The outlook for 2003 is mixed; some expect an uptick, others see flat, a few forecast negative growth. In such haze, it's hard to know what's going or coming. "The other problem in this environment is that there's really not a consensus as to what's the 'next big thing'," Boettcher warned the audience, "and that's what we're here today to talk about."

The tech universe has settled down into the 'new normal period' as one U.S. magazine put it — investment, development and growth is evolutionary and based on results, not raw speculation. Most importantly, information technology or IT has firmly and quietly woven itself into the world. What was once 'gee whiz' is now embedded, ubiquitous and becoming ever more prevalent.

Overhanging it all, Moore's Law.

In 1965, Intel co-founder Gordon Moore observed that the number of transistors per square inch on integrated circuits had doubled every year since the integrated circuit was first invented and predicted the exponential growth would continue for the foreseeable future. Although data-density has since slowed, doubling approximately every 18 months, this is the current definition of Moore's Law. Most experts, including Moore, expect it to hold true for at least another two decades.

But predicting the future is anyone's guess. Still, the panel did its best.

Internet, hydrogen economy and tiny gizmos

Boettcher believes the 'next big thing' isn't one thing per se but a synergistic combination of 'trend technologies' – semiconductors, nanotechnology and so forth – "building on up the stack" to subsystems, systems, devices and, eventually, consumer applications; communications technologies driven by the Internet; the convergence of bio-tech and nanotechnology (e.g. tiny, tiny robotic cleaners literally clearing out arterial sludge from within).

The 'hydrogen' economy is another biggie. Fossil fuels and internal combustion engines will give way to clean-burning fuel cells and local or domestic power systems. No more dirty, polluting central power plants connected by ugly land-eating power grids, no lung-clogging exhaust. Don't hold your breath however; Boettcher thinks the true hydrogen economy will be a reality in 50 years or so. For example, automobile fuel cells are getting a lot of media play but market realization is years away. "But between then and now, I think there will be other many, many exciting investment opportunities."

Agreed, says Douglas Lockie, serial entrepreneur and executive vice-president and founder of publicly listed semiconductor firm Endwave. A self-described "communications guy", Lockie wondered aloud why he's focused on hydrogen. His answer: "Every engineer worth his salt, should."

Unlike fossil fuels, hydrogen can't be mined or pumped; it must be "pulled apart" from water, H_2O, and that takes energy applied efficiently. So when Lockie "ran across some guys who had a nifty way" to make pure hydrogen for cheap using microwaves, he got involved. They were fixated on the nascent car market. Lockie steered the company into an existing market: the $200 million per annum of hydrogen used to clean, anneal, bond and whatever silicon wafers. With revenues coming in, the company can prepare for the larger auto market to come, one day.

Switch gears. In the movie *The Graduate*, a very young Dustin Hoffman was given the one-word vision of the future: "plastics." Today, say Lockie, it would be "silicon" . . . but not just any sliver of glass. Think Moore's Law and prepare for faster and cheaper chips and extreme data volumes. Think wireless, comprehensive, gallium arsenide, indium phosphide, silicon germanium "all the way through 100 gigahertz" in practical, stable products. "Never bet against integration," warned Lockie. "Never bet against silicon."

But do bet on the future of wireless: copper wire can't

carry the expected traffic. Although fibre-optics is becoming ever cheaper, laying cable will remain costly. "We don't have a backhoe yet that can follow Moore's Law." The United States has about 8,000 business buildings already connected by fibre optics with another 3,000 linkages planned. Great but 750,000 or so other business centers will likely remain fibreless due to prohibitive installation costs. How to connect them into the high-speed network? Atop each 'fibre' building, imagine a small yet powerful gigahertz wireless nodule, tightly directed to the other buildings and with enough radio spectrum to handle Ethernet traffic far beyond the capabilities of the Internet. Predicts Lockie: "The real business opportunity is hooking enterprise computers to enterprise computers."

B.V. Jagadeesh, president and CEO of Netscaler got a bit technical. But it was a tech-savvy audience and his observations that, say, the markets which initially chose not to invest in high-density rackable servers might (or might not) be the first to opt for next-generation blade servers (assuming the problems of load balance and security can be solved) did resonate.

Ditto with the challenge (read: market opportunity) to find better technology to mange multiple clients/servers from a central 'single view' location yet have the ability "to switch on various policies for different customers" without compromising security and response time. Jagadeesh believes "there will be a tremendous amount of investment to solve those issues."

"Good enough" sell

Dr. Nick Tredennick, editor of *Gilder Technology Report*, advisor and investor in a number of pre-IPO companies, cheerfully warned about Moore's Law's mesmerizing hold on "the white-socks engineering crowd, all at the leading edge, all wanting more and wanting to design more."

The reality check: beware the rise of the 'value PC' and the average consumer's belief that today's 'good enough' home computers are exactly that: good enough . . . so be carefully about funding expensive things that few people really need or want. Warns Tredennick: "Moore's Law says what can be done. Market demand says what will be done."

Market pragmatism will also lead to the rise of the 'value transistor' and that will put a crimp on the EE's instinctive drive for increasingly 'tighter' chips and ever more costly wafer fab plants.

Another reality check: The current micro-processor market is about eight billion units a year; only a minute fraction or about 150 million units a year are high-end super chips. The rest of "the huge market" belongs to low-cost chips, 250- and 180-nanometer stuff where the manufacturing plant costs are now amortized or almost so.

Although better chips will always be made, Tredennick believes 'good enough' will dominate the market; chip foundries cater to customer orders and "fewer and fewer applications are buying the new process." However, the emerging rise of reconfigurable systems, ever-more sophisticated mobile devices and programmable logic devices will ensure the new chips will always find a healthy market.

Moore falters, VCs quail?

Over the last 30 years, the transistor shrunk a thousand-fold, performance jumped 10,000-fold and price dropped by 10-million-fold, mused Dr. Robert Yung, chief technology officer/enterprise processors for Intel Corporation. But now there's "lots of doubt in the industry" that Moore's Law can be sustained: 65-nanometer chips will soon roll out, 30-nanometer designs have already been proven in the lab . . but at this scale, viruses loom large and nature's barriers (e.g. quantum interference) become profound.

But although Moore might slow, it won't stop, the need for more powerful computing, and the convergence of other technologies – 3D stacking, parallel linkages etcetera – will tighten the slack. The West is increasingly interconnected via wireless, the vertical integrations are broadening out, the technology widening into "more horizontal types of modular architecture" which will promote more integration and open up niche specializations for smaller tech players.

Today, the average insect is smarter than our best computers. In maybe the next 50 years – but only if Moore's Law holds true – Dr. Yung speculates that technology will achieve "some saturation point" where silicon "is good enough to do most of the things we humans know how to do today. Maybe, by then, we won't have to worry about a job, or we'll all be retired."

The audience chuckled, nervously. ❑

– By David Leidl