

ALLEGIS CAPITAL QUARTERLY

Lean, Mean Research Machines: The Changing Paradigm for Innovation

By Robert R. Ackerman Jr., Managing Director

THE MOST IMPORTANT COMPETITIVE EDGE of any successful technology company is its ability to innovate. But keeping the innovation tool sharply honed is also one of the most difficult tasks any company faces, especially as globalization increases competition and the pace of innovation.

As a result, there is a tectonic shift taking place in the way corporations approach research and development. As strange as it may sound, corporate research labs are playing a decreasing role as centers of innovation. Increasingly, smart companies are looking outside their own research labs, at government and university research teams and entrepreneurial startups to find new technologies. Henry Chesbrough, a former Harvard professor now at the Haas School at the University of California at Berkeley, calls it "Open Innovation." This is a new paradigm for corporate research, and it represents the future of companies' ability to remain innovative.

At Allegis Capital, we believe that a new era of partnerships between established companies and innovative startups is the ideal solution. It is a simple solution, but it is not an easy one.

Stalling the Innovation Engine

It may be hard to start an innovative new project at a big company, but once started, it's even harder to kill it. Once funded, projects take on a life of their own. Even at companies that have been built through successful innovation, problems can arise. The larger you get, the more you have to lose. Big companies end up sustaining themselves on their legacy technologies, suckling on the endowment they have created. A culture develops around maintaining the franchise, making it harder to do radically new things.

Large companies also have a tendency to confuse size with ability: We're big and successful and therefore we can do anything. Failure becomes a career-limiting event, destroying the tolerance for risk-taking. All innovation begins with smart people, but it is only maintained with the proper culture. As inertia grows, the best and most innovative people throw up their hands in frustration and leave.

The only time companies get past this is when they are willing to put on blinders to their history. Lou Gerstner was the right person to turn around IBM because,

"Why are smart companies looking outside themselves to find important new breakthroughs? Welcome to the age of 'open innovation.'"

“VCs help create a culture of constant change, a culture that demands performance and excellence, and they understand risk and failure.”

as an outsider, he had no vested interest in the history of the company. He was able to look at the tools available to him and redefine the company. But big companies typically only make such a radical shift when they're faced with the choice of changing or dying, and many fail to do so even then. It is a difficult path to take, and most people, given a choice, will take the easier path.

Creating an internal “skunk works” team, isolated from a company's legacy technology, is also sometimes successful. But the risk is that even the new products and technologies then become institutionalized, taking on the inertia of the corporation. This is not often a sustainable approach to maintaining innovation.

Globalization, which offers both new opportunities and new challenges, is now complicating the situation even further. While it holds out the promise of tapping major new emerging markets, it also reduces the geographic protective barriers that have historically insulated markets and served to prop up margins. Protected companies always lose their innovative edge, and they are now facing global markets that are growing in a more open and more competitive fashion, which typically means lower profit margins.

Pharmaceutical pricing provides a good data point. U.S. pharmaceutical companies, protected by U.S. patents, have traditionally been able to charge very high prices for the products of their expensive research. But U.S. consumers are now able to buy drugs from Canada through the Internet, at much lower prices, and the practice will spread to emerging nations as well. Despite the best efforts of the U.S. industry to end the practice, this trend cannot be stopped. Some of the same politicians who are condemning outsourcing as a strategy of American companies are asking why U.S. citizens should not be able to buy drugs from Canada.

With margins getting squeezed and the old ways of innovating proving less effective, something has got to give. Huge internal R&D budgets are no longer cost-effective. Big companies need to find new ways to innovate.

Fast, Cheap, and Out Of Control

Small, entrepreneurial companies, on the other hand, are increasingly taking over as efficient research engines. Several years ago, large cor-

porations were funding 70 percent of corporate research and development in the United States. That figure is now down to just over 41 percent. At the same time, R&D spending at small companies, those with 1,000 to 5,000 employees, has increased from 10 percent of the total to about 36 percent.

Small companies are lean, mean, innovation machines. They play well in markets where the highest value comes from efficiency and speed. It can be difficult for a startup to get the right funding to develop their products, but once started, they have to move quickly or die. Venture backers require them to meet regular milestones, so they either demonstrate forward traction or they're out of business. It creates a culture of constantly living on the edge, of pushing the innovation engine to go as fast as possible, enabling them to run circles around billion dollar corporate R&D labs.

This encourages a culture that demands performance and excellence, and only attracts very confident and committed individuals. They defy the laws of gravity and nature through sheer force of personality. Those who succeed find untold rewards.

But failure at a startup is not a career-limiting move. VCs understand the risky nature of the business, and entrepreneurs can come back and try again. They cannot do it indefinitely, but they get second and third chances if they show promise.

However, startups also have a big disadvantage. They do not have the brand recognition or infrastructure to get products to market quickly. Further, there is a tipping point as markets mature. A new market is first driven by innovation, but as they grow, they're driven by economies of scale. The need for scale may develop faster than a startup's ability to provide it. Startup companies then discover that the innovation was the easy part. Getting to market is the larger, more expensive hurdle, and represents a higher probability of failure.

This problem will also increase for startups as the pace of globalization continues to gain momentum. Most startups tackle the North American market first, in order to benefit from its scale and efficiency. A product in this market can potentially meet 280 million consumers.

Two years later they may decide to hit Europe, where they find 17 competitors vying for 300 million customers, divided into different sub-markets with different languages and cultures. After another two years they may look at Japan, where the culture is resistant to the introduction of new ideas, especially from overseas.

In an increasingly global environment, companies will no longer have the luxury of rolling out one product at a time. The margin of error goes up exponentially, and the amount of money required increases by an order of magnitude. This means startups need to think about new ways of getting products to market.

A Convenient Marriage

That is where partnerships between large and small companies can be a huge advantage. When selling a product demands a physical presence and a strong distribution network, a startup cannot match the power of a large corporation. But when a large company buys a startup outright, the result can be cultural conflicts, with the inertia of the big company overwhelming the speed of the small one. The best solution is to create an environment in which small companies act essentially as outside R&D labs for big corporations, which can more easily handle manufacturing and distribution, taking advantage of their established brand.

The challenge is to match up small and large companies in a way that will be strategically advantageous to both. The two types of companies have slightly different DNA, and both will value their own strengths more highly. Big companies, for example, like control. They may be willing to work with a small company, but usually insist on doing things their way. To a small company, size does not necessarily connote respect. Startups move at the speed of light relative to large ones, and it can be difficult to synchronize the two firms.

The difficulty is akin to finding a donor for a heart transplant. You need compatibility, and still have to suppress the immune systems that would cause one entity to reject the other. The ability to do this requires a completely different set of skills, from someone who understands both worlds and is comfortable dealing with them.

As you may have guessed, that is the ability we have emphasized at Allegis Capital. We select both our corporate investors and the startups that we fund in order to create that synergy. From experience, we know that it is not always an easy process. But it is possible. In our next issue, we will discuss how it can be done.

One thing we can tell you for certain: Unless there is someone focused on the long process of building relationships based on mutual respect for complementary strengths, it is not going to happen. Choose your partners carefully. ■

“The new paradigm means that small companies and start-ups should partner with large companies, understanding that they have different DNA.”

Venture Activity Update

The venture capital activity in Silicon Valley and the rest of the US increased modestly in the second quarter. Anecdotally, we saw more startups and more venture investors pursuing those startups. Good deals were once again competitive. The numbers released by PricewaterhouseCoopers confirmed our experience. They report that venture capitalists invested \$5.6B in Q2 of 2004 which is approximately 10% more than was invested in Q1 of 2004 (\$5.0B). This activity is substantially more than was seen in Q2 of 2003 when only \$4.8B was put to work, and the number in the current quarter is comparable to what was invested in 1998. What is perhaps most interesting is that there is a dearth of activity in the seed/startup stage. That sector only received \$83M of venture capital investment, and early stage received \$1.1B; expansion stage received \$2.7B. Valuations saw a slight uptick from the prior year for early stage investments; later stage investments saw a bigger uptick in valuation.

During the second quarter, Allegis invested in two seed stage companies: ActiveGrid (www.active-grid.com) and ClariPhy (www.clariphy.com). Within the Allegis portfolio, Vernier Networks (www.verniernetworks.com) raised a \$12M round from its previous investors after hiring a new CEO, Simon Khalaf. ■

The Dance Of The Seven Foils

Seven Simple (not easy) Steps to Getting our Attention

“Tell us about how the world is ‘Before’ and ‘After’ this great venture. Think on a grand scale.”

By Jean-Louis Gassé, General Partner

AS PROMISED IN OUR LAST NEWSLETTER, I’d like to offer a way of pitching a company to venture investors whose nerve endings have been cauterized by hundreds of such meetings. Note I wrote a way, not *the* way. There are many ways to get to a second meeting, including, believe it or not, no PowerPoint presentation, just a chalk talk.

1. Credentials. (Please note: no agenda, no meandering introduction—we know why we’re meeting.) Let’s say you worked 10 years as a Starbuck’s executive, great venture success. We might not listen very well if you come and pitch a Web Applications Management company—unless you were the very successful CIO of that company, a key to efficiently spreading its operations beyond the US, in Japan and in Europe. You and your team’s past comes first and establishes your authority on the topic at hand.

2. The Fundamental Problem You Solve. Think on a grand scale. Tell us about the world “Before Us” and the world “After Us.” These words might sound grandiose and some might pretend to criticize you for your excesses. Pay no mind. That should be a compliment. It is far better to be criticized for grandiosity than to leave us thinking, “Sorry, too small.” A rule of thumb, this week, is you must be on your way to creating an enterprise worth at least \$250m somewhere in the next 3 to 5 years.

Remedies, inventions, silicon or software can be sorted into three bins: Better, Impossible and Unthinkable. Gross margin opportunities increase from left to right, from tight to nice to obscene. We probably won’t fund Better, the field is already crowded. Unthinkable is a figure of speech, audience and timing: bitmapped screens, moveable windows, pull-down menus and pointing devices were unthinkable for The Rest of Us until the Lisa and its hardier child,



the Macintosh. There is, of course, the small matter of implementation. We all know the costly refrain: It’ll work because it’d be cool if it did. That’s where your credentials help the conversation, at least initially. (Your credentials and everything else will face the dour countenance of Due Diligence later. More on that subject in a future newsletter.)

3. The Market. Who/where are the customers, how many are there, how do you propose to reach them, and, most importantly, how do you plan to transfer money currently residing in their pockets into the new company in an inexpensive, nice, legal and, above all, repeatable manner. One could consider separate slides for Channels and the Business Model; I’ll discuss this in a moment.

4. The Competition. There is always competition, even if your product is so unthinkable as to be unique—for a while. A new product or service has to displace someone’s budgets, has to compete with on-going spending which previously went to some other company. Bill Walsh, the famous Stanford and 49ers coach, always described other teams in glowing terms. Nothing

lost in emphasizing the strength on your (soon to be ours, that's why you're here) opponents. On the contrary, doing so yields two benefits: you sound secure, objective, and you preempt any objections. That way you won't be put on the defensive.

5. What We Own. Intellectual property, patents, trade secrets, key people. What's defensible and for how long. What are the barriers to entry? Nothing like a nice monopoly to warm the cold hearts of venture investors.

6. Financials. Project revenue, expenses, profit and losses, cash needs for the next 4 or 5 years. You'll immediately argue it's impossible to forecast revenue, let alone profits a lifetime into the future. We know that the numbers we're asking you to put forward and the reality of launching a new venture won't connect. But rather than saying I don't know or worse, giving us a disgusted Parisian *ma tre d'* look, think again. We are asking for your opinion, your view of the future. Entrepreneurs are fortune tellers. You tell us how we are going to make a fortune together.

A useful format is to put Revenue at the top, and Cash, at the very bottom, in absolute dollars. We like to know the depth of the cash hole. The other numbers, Gross Margin, R&D expenses, Sales and Marketing, G&A and Operating Profit are better expressed in percentages, even if, the second year, R&D is still a "shocking" 70% of Revenue. Looking at the percentages tells us what kind of business you're in and when it makes the transition from the dangerous take-off regime to the more stable climb phase of flight. Please meditate over the Gross Margin number. It tells us the level of esteem in which the market holds you (your company, but that's not different right now) and how you're doing against your competition.

7. The Timeline. On this last foil you draw several parallel time lines. The first line shows what happens over time with the product, releases, and additions to the product line. The next shows what happens with customers and/or channels, when we reach our tenth VAR or our 100th end-user, hundred thousand copies shipped. The next line indicates revenue events such as the first million dollars in revenues, the achievement of a \$10m run rate. The final line is for financing

events: Series A, Series B, the \$400m IPO.

This last foil gives a feeling you are in command, you're the field general and you do have a plan for your 4-year campaign. And speaking of the financing events, this is a good time and place to state you're looking for \$x million and, even more importantly, strong and knowledgeable investors. Known refrain, but it's how you sing it that matters.

Looking back, you'll see the advantages of such a compact formula. You can spend two minutes or two hours, if the audience is so engaged, on any of these foils. And nothing prevents you from hiding 150 backup foils under the table and whipping them out when productive. That's where the missing Channels or Business (I prefer Revenue) Model slides slide in.

Also, going back to the introduction, or apparent lack thereof, quickly flipping through the seven foils is the best agenda, the best summary, the best introduction you can give, especially if your audience relaxes as a result of seeing they're in for a mercifully short presentation. Last and perhaps strongest positive: a short presentation leaves time for the most important part of the meeting, the back and forth, the exchange, the precious moments when the mayonnaise starts to "take," when the collaboration starts to build.

Now, one more question, one objection and we're done: why are we doing this? Isn't this disturbing the natural selection process where only the more capable entrepreneurs are meant to survive? It would appear so. But in our view, there is little correlation between the initial ability to express ideas clearly and concisely, and success as an entrepreneur. What if a great technologist is so possessed by his or her idea they have a hard time explaining it to mere mortals?

In other words, we're interested in getting the core idea out unobstructed by nervousness, inexperience or plain lack of focus on what investors need.

To answer the "fiddling with natural selection" objection, we don't play with genes, we hope to be good midwives. ■

"A short presentation leaves time for the most important part of our meeting, the back and forth, the exchange."

Staccato Communications: Pulse of the Wireless Machine

“Ultra Wide Band’s first big move: USB 2 without cables. Staccato is there with product and with the standards.”

THE EVOLUTIONARY BIOLOGIST Richard Dawkins caused a stir when he proclaimed that the real purpose of human life is to propagate our DNA—not the other way around. Are we humans the crowning triumph of evolutionary advance, or, gulp, are we mere life-support and reproductive systems for an even higher end, the seemingly mindless spiraling helix of chemicals that is our DNA? It’s the kind of question that produces endless philosophical debate and some classic sci-fi nightmare stories. There is a contemporary tongue-in-geek version of this conundrum that ponders whether computers are the embodiment of our greatest technological wizardry, or are they a mere life- and reproduction- support system for the *real* ever-advancing life form, which is the ubiquitous tangle of almost DNA-like cables?

At home, looking behind the pristine iMac and the hairy hand-built PC, I wonder if they are reproducing when I’m not looking. The coiled, sprawling and almost DNA-like twisting of the wired nightmare lurks just behind my desk... and surely it is larger than it was a few weeks ago.

Enter Roberto Aiello and his company, Staccato: Dr. Aiello is bent on exterminating computer cables from the face of the earth. He believes that digital devices, not wires and plugs, must triumph.

For his first battle, Aiello uses a once esoteric technology, UWB (Ultra Wide Band) to extinguish the tangled web of USB cables now connecting printers, storage devices, scanners, projectors and dozens of others, and replace them with a wireless connection that can in theory deliver a throughput of up to 480 megabits per second. (That’s roughly analogous to 20 high-quality photo JPEG files per second.) Yes, there still will be power cords, but imagine scanning, backing



UWB: The challenge is to transmit data inside the “noise” of a hand clap.

up, uploading, storing, and printing without those gender-sensitive USB cables.

As UWB technology develops, Staccato also sets its sights on other applications in the digital home: the high-speed exchange of HD video between PVR, display monitors and computers. That’s Dr. Aiello’s story.

Or, rather, the latest chapter. Born in Trieste, Italy, about a hundred miles north of Venice, Roberto began his professional life as a research scientist. Armed with a PhD from the University of Trieste (known for its Abdus Salam International Center for Theoretical Physics), Roberto embarked on a series of assignments, such as “on the fly” reprogrammable parallel processors, synchrotron light sources; and stints at the now infamous Dallas Superconductor Supercollider, as a visiting professor at the Arcetri observatory in Florence, and at the SLAC (Stanford Linear Accelerator), controlling the flight of particle beams. Then, in 1996, as Roberto puts it, he caught the “Silicon Valley fever,” and joined

Interval Research (Paul Allen's attempt at building version 2.0 of Xerox PARC), to work on Body Area Networks, a means to connect the organs of wearable computers. That was the beginning of his involvement with Ultra Wide Band technologies. In 1999, after working on several UWB-related projects, Roberto founded Fantasma Networks, the only Interval Research spin-off to receive funds from outside venture investors. Fantasma used UWB technology to provide wireless transmission of video at 60 megabits per second in the home. In 2001, Pulse-LINK acquired Fantasma Networks and transferred its activities to its headquarters in Qualcomm's hometown, San Diego, California, which has become the Redmond of wireless technology.

In 2002, Roberto starts Staccato Communications with Mark Bowles and a group of former colleagues and experts in the fast-growing UWB field. Besides the core goal, Wireless USB 2.0, Roberto and his team are moved by a lesson learned in previous incarnations: the only way to keep industry standards from ruling, and sometimes ruining your future, is to take part in the time and labor intensive process of developing those new 802.xx documents, and if possible, lead the standards-making groups. To paraphrase Lyndon Johnson: *Better to be inside the tent drafting out, than outside hissing in.* Besides designing and debugging silicon, this is what Roberto, Mark and colleagues have been doing since Staccato Communications was started.

Do a Google on UWB, Roberto Aiello, Mark Bowles, Larry Taylor, Jason Ellis—or simply go to Staccato's press room (www.staccatocommunications.com/pressroom) for a description of what the company describes as "fast and furious" activity, in particular for the Multiband OFDM Alliance, a group focused on a better way to use UWB. OFDM stands for Orthogonal Frequency Division Multiplexing, and you can go to www.multibandofdm.org for an impressive list of 170 companies committed to UWB Multiband OFDM.

Because it gets very technical very quickly, we've put off an explanation of what UWB really is and how it works. Staccato's own site offers an "About UWB Technology" page. (There is

also an excellent background explanation of UWB in *Scientific American*, May 2002 available at www.sciam.com/2002/0502issue/0502leep-er.html).

But let's try a shorter version. It requires tolerance for the occasional oversimplification, and a rudimentary understanding of the article of faith known as the *Fourier Transform*: any signal is, in fact, a sum of sine waves. Clap your hands in front of an open grand piano, and you'll hear strings resonate seemingly randomly. But mathematicians know the resonating isn't random, that some strings are picking up discrete frequencies inside the abrupt sound. The shorter the cracking sound, the broader the range of frequency components that are produced.

But the energy conservation dictat remains: the sum of the energies of all components is equal to the energy of the pulse. So much so that in the case of extremely short pulses, the many frequency components become so weak that they're weaker than the ambient electromagnetic noise (think of us swimming in a sea of radio frequencies).

This, in a way, is the key fact of UWB, one that creates much misunderstanding: how can you transmit information with a signal buried inside *noise*? The answer is both simple and difficult. With what has to be exquisite precision, you collect energy on each, and only on each, of the frequencies composing the pulse, and the original signal re-emerges from the ambient noise. The latter is a random phenomenon. Think of the snow on a TV without a signal—not all points of the screen are white at the same time; only part of the time, at random intervals.

Noise can do serious damage to one weak signal at one frequency. But in UWB there is a very wide range of frequencies which have a much smaller chance of taking serious damage during the narrow time window of a very short pulse. (The phrase "time domain" is often used in UWB context.)

More consequences: UWB transmission can happen inside a band that is already used by other conventional communication, because conventional electromagnetic communication uses a narrow/wide combination of domains (narrow frequency band, wide time domain), just the

"The only way to keep industry standards from ruling or ruining your future is to take part in the long, intensive process of developing those new standards... and sometimes leading the way."

“Better to be inside the tent drafting out than outside hissing in.”

opposite of UWB (ultra-short time for the pulse, very wide band of resulting frequencies). In practical terms, “owners” of these bands (that’s the way individuals and companies think of the frequency bands We The People license to them) resent the intrusion. In theory, very weak signals—GPS for example—could suffer if enough UWB transmissions added up enough energy and drowned out satellite transmissions to navigation devices, or if UWB devices were built and operating poorly, spilling energy all over the ether.

A major technological challenge for UWB is that if you don’t know which frequencies to listen to, you won’t even sense a signal. You need to listen to pick up the exact series of frequencies to see the transmission “inside” the noise. This helps if you’re building secure communications networks, but it complicates the job of building receivers. Such common components as capacitors or inductors can’t be used, because they damage the delicate UWB signals in the course of finding them.

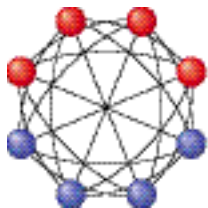
Lastly on properties: UWB signals propagate in unusual ways—some go through walls and can

penetrate the ground—leading to future military and security applications.



Staccato is developing both silicon and software for systems that eliminate the cables in USB 2.0 connectivity systems, while leaving in place the architecture and functionality of USB 2.0 that is now installed on computers and devices. The goal is to “slide” under the USB driver so nothing in the device you set free, nothing in the software applications for these, gets disturbed. With 100 million or so PCs sold each year, and 4 devices now “detached” around each PC, a vast market awaits wireless USB 2.0 solutions. (See a white paper written by Rafael Kolic, an Intel executive, for his company’s wireless UWB worldview, at www.intel.com/update/contents/wio7032.htm). The names, big and small, posted on the MBOA web site—from Intel and Texas Instruments to Sony, Samsung and Phillips—give an idea of the vast ecosystem of competitors and partners of which Staccato is a part.

As for the company name, *staccato* is a musical term—it tells you to play the notes “cut short crisply”—in short pulses, if you will. ■



ALLEGIS
CAPITAL

Allegis Capital invests in early stage companies developing enabling technology and infrastructure to serve emerging information technology markets.

MAIN OFFICE

100 Hamilton Avenue, Suite 250
Palo Alto, California 94301
(650) 687-0500
Fax: (650) 687-0234

SANTA MONICA, CA OFFICE

100 Wilshire Boulevard, Suite 1770
Santa Monica, CA 90401
(310) 319-3880
Fax: (310) 319-3881
www.allegiscapital.com