

# An Engineer's View of Venture Capitalists

By Nick Tredennick, with Brion Shimamoto, Dynamic Silicon

I first encountered venture capitalists (VCs) in 1987. Despite a bad start, I caught the start-up bug. In the years since, I have worked with more than 30 start-ups as founder, advisor, engineer, executive, and board member. It's a lot more than that if you count all the times I've tried to help "nerd" friends (engineers) connect with the "rich guys" (VCs). Naturally, I've formed opinions along the way. Many books and articles eulogize VCs. But here I want to present an engineer's view of VCs. It may sound like I'm maligning VCs. That's not my intent. And I'm not trying to change human nature. VCs know how to deal with engineers, but engineers don't know how to deal with VCs. VCs take advantage of this situation to maximize the return for the venture fund's investors. Engineers are getting short-changed.



Fortunately, engineers are trained problem-solvers--I want to harness that power. Engineers, armed with better information about how VCs operate, can work for more equitable solutions. I'm not offering detailed solutions--that would be a book. Rather, this is a wake-up call for engineers.

My first experience with VCs was as an engineer starting a microprocessor-design company; VCs were the gods of money. The other founders and I told the VCs what we thought we could do and how long it would take. We believed it; they believed it; we were all naive. I had designed two microprocessors, had written a textbook on the topic, and had taught at a well-known university. They thought I knew what I was talking about. We landed money from premiere firms on Sand Hill Road in Palo Alto, Calif. We told them a year; it took something like seven years and it took major changes in strategy to get there.

I wasn't the CEO; I hired and managed the engineering teams that eventually reached the goal. I wasn't there for the finish. I had a run-in with the other founders, including the CEO, over how to manage engineers. It was micromanagement versus laissez faire. (Their attitude: "Turn your back on them and they'll sit on their hands." My attitude: "Turn these particular engineers loose and they'll work themselves to physical ruin.") We were in danger of losing good engineers to morale problems. I suggested to the board that firing all of the founders, including me, might solve the problem. A new team might manage more consistently.

The board member from our largest VC firm invited me to his house in Woodside for a chat about the morale problems. Acres, opulence, wealth. We sat in leather chairs on a black marble floor. Behind him, through the glass wall, I saw major excavation and construction work going on up the hillside. "It's too bad someone is building a resort hotel so close to your house," I said. "That's my new house," he said. "This one will be torn down when that one's finished."

We talked about the situation at the start-up. I outlined my concerns. I handed him a list of names. "Here's contact information for some of the project engineers. The first four will tell you what I have told you. The fifth will say the following things...." To his credit, he interviewed the engineers. Also to his credit, he called to tell me the result. "Everything you said is as you said it was." I felt relief. I had struggled with a deteriorating situation for a year and a half.

We agreed on the problem; we agreed on the circumstances--a solution was on the way. They told me: "We think you should resign." I left; the problems didn't.

### **Guide to venture capitalists**

The VC connects wealthy investors to nerds. There are few alternatives. You can self-fund by consulting and by setting aside money for your venture. That doesn't work. You could go to friends and family, but that risks friendships. You could find "angel" investors, but that only delays going to VCs.

The VC community is a closed one. It caters to a restricted audience. In fact, you don't get to meet a VC unless you have a personal introduction. Don't send them your business plan unless the VC has personally requested it.

### **VCs don't sign nondisclosure agreements.**

That affords them protection if they like your ideas, but they want to fund someone else to do them. At least two of my friends have had their ideas stolen and funded separately. One case was blatant theft--sections of the original business plan were crudely copied and taped into the VC-sponsored plan. My friend sued and won a moral victory and a little money. The start-up based on the stolen idea went public and made lots of money for that start-up's VCs. Most entrepreneurs don't have the time, the means, or the proof to sue. In the second case, venture firm D sent its expert several times for additional "due diligence" regarding the possible investment. My friend got funding elsewhere, but D funded its expert with the same ideas.

### **VCs are sheep.**

The electronics industry is driven by fads, just as the fashion and toy industries are. The industry is periodically swept by programming language fads: Fortran, C++, Java, and so on. It's swept by design fads such as RISC, VLIW, and network processors. It's even swept by technical business fads such as the dot-coms. No area is immune. If one big-name VC firm funds reconfigurable electronic blanket weavers, the others follow. VCs either all fund something or none of them will. If you ride the crest of a fad, you've a good chance of getting funded. If you have an idea that's too new and too different, you will struggle for funding.

### **VCs aren't technical.**

Mostly, they aren't engineers--even the ones with engineering degrees. An engineering degree is a starting point. If you design and build things, you can become an engineer; if you work on your career, you can become an executive or a venture capitalist. VCs in Silicon Valley are as technically sophisticated as VCs come. As you get geographically farther from technical-industry concentration, investors become more finance-oriented and less technically-oriented.

Like all people, they dismiss what they don't understand, your novel ideas, and they focus on what they know, usually irrelevant marketing terms or growth predictions.

### **Experts aren't very good.**

The VC will send at least one "expert" to evaluate your ideas. Don't expect the expert to understand what you are doing. Suppose your idea implements a cell phone. The VC will send an expert who may know all there is to know about how cell phones have been built for the last 10 years. As long as your idea doesn't take you far from traditional implementations, the expert will understand it. If you step too far from tradition--say, with a novel approach using programmable logic devices instead of digital signal processors--the expert will not understand or appreciate your approach.

One company I worked with had an innovative idea for a firewall: build it with programmable logic and it works at wire speed. Wire speed meant no buffering, no data storage, and therefore no need for a microprocessor or for an IP (Internet Protocol) address. Simple installation, simple management, but so different that experts--even those from programmable logic companies--didn't understand it. To them, proposing a firewall without a microprocessor and an IP address was like proposing a car without an engine. No funding. Back to work at a big company. Worse for them; worse for us. The industry loses. Progress is delayed.

### **VCs don't take risks.**

VCs have a reputation as the gun-slinging risk-takers of the electronics frontier. They're not. VCs collect

money from rich people to build their investment funds. Answering to their investors contributes to a sheep mentality. It must be a good idea if a top-tier fund invested in a similar business. VCs like to invest in pedigrees, not in ideas. They are looking for a team or an idea that has made money. Just as Hollywood would rather make a sequel than produce an original movie, VCs look for a formula that has brought success. They're not building long-lasting businesses; they're looking to make many times the original investment after a few years.

When VCs build a venture fund, they charge the fund's investors a management fee and a "carry." The carry, which is typically 20 to 30 percent, is the percent of the investors' profit that goes directly to the VC. The VC, who gets a healthy chunk of any venture-fund profits, may have no money in the fund. Even a small venture fund will be invested across a dozen or so companies, spreading risk. Also, the VC, as a board member, will collect stock options from each start-up the fund invests in.

The rich investors take some risk, though their risk is spread across the fund's investments. The real risk-takers are the entrepreneurial engineers who invest time and brain power in a single start-up.

### **Venture funds are big.**

Too big. If your idea needs a lot of money, say \$100 million, then you have a better chance of getting money than an idea that promises the same rate of return for \$1 million. The VCs running a \$1 billion fund don't have the time to manage one thousand \$1 million investments. It won't even be possible to manage two hundred \$5 million investments. It's better to have fewer, bigger investments. In such an environment, if you need only \$5 million, your idea will struggle for funding.

### **VCs collude.**

VCs collect in "bake-offs" that are the VC's version of price fixing. They discuss among themselves funding and "pricing" for candidate start-ups. Pricing sets the number of shares and the value of a share, and is typically expressed in a "term sheet" from the VC to the start-up. VCs optimize locally. It wouldn't do for several of them to fund, say, six companies in an industry wedge. Limiting the options to two or three limits competition and makes the success of the few more likely. The downside: limiting competition stifles innovation and slows progress. As in nature, competitive environments foster healthier organisms. Innovation is the beneficial gene mutation to the current technology's DNA.

I attended a recent talk by a VC luminary, who gloated over the state of the venture industry, after money for technology start-ups was scarce. Here's my summary of the VC's view:

"A year ago there was too much money available, so there was too much competition to fund good ideas. Valuations for pre-IPO (initial public offering) start-ups were too high. Start-ups could get term sheets from several venture firms and select the most favorable. Too many ideas were getting funded. With too many rivals, markets might never develop. The current market is much better. Valuations are reasonable and, with few rivals in each sector, new markets will develop--as they might not have with many rivals."

This is nonsense. Look, for example, at hard disks and floppy disks. In the hard-disk business, there have been as many as 41 rivals fighting for market share. Only three major manufacturers competed in floppy disks. The hard disk has improved much faster technically; the floppy disk is stagnant by comparison. I'm not talking about market size or market opportunity (the hard-disk business versus the floppy-disk business); I'm talking about rates of innovation.

### **VCs don't say no.**

If the VC is interested, you can expect a call and, eventually, a check. If the VC is not interested, you won't get an answer. Saying "no" encourages you to look elsewhere--that's not good for the VC, who prefers to have you hanging around rather than going elsewhere for funding. Fads change; the herd turns; your proposal may look better next year. In addition, the VC may want more due diligence from you--to add your ideas to a different start-up's plan.

If VCs think you have few alternatives, they will string you along:

"I love the deal, but it'll take time to bring the other partners along."

"We need more time to get expert opinions."

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"We're definitely going to fund you, but we're closing a \$500 million fund, and that's taking all our time."

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"I'll call you Monday."

Once your alternatives are gone, they negotiate their terms.

### **VCs have pets.**

The VC's version of a pet is the "executive in residence." Many venture firms keep a cache of start-up executives on staff at \$10 000 to \$20 000 per month (a princely sum to an engineer, but just enough to keep people in these circles out of the soup kitchens). Start-up executives, loitering for an opportunity, may collect these fees from more than one venture firm, since the position entails no more than casual advising. These executives have "experience" in start-ups. When you show your start-up to the VCs, they will grill you about the "experience" of your executive team. It won't be good enough, but not to worry, the VC supplies the necessary talent. You get a CEO. The CEO replaces your friends with cronies.

The VCs' pets are like Hollywood's superstars. Just like Julia Roberts and Tom Cruise, the superstar CEOs command big bucks and big percentages (of equity)--driving up the cost of the start-up--but are "worth it" because they give investors and VCs a sense of security.

### **Your idea, your work, their company.**

The VC's CEO gets 10 percent of the company. VC-placed board members get 1 percent each. Your entire technical team gets as much as 15 percent. Venture firms get the rest. Subsequent funding rounds lower ("dilute") the amount owned by the technical team. Venture firms control the board seats. The VC on your board sits on 11 other boards. Board members visit once a month or once a quarter, listen to the start-up's executives, make demands, offer suggestions, and collect personal stock options greater than all of the company's engineers hold, with the possible exceptions of the chief technology officer and the vice president of engineering. The VC's executives control the company. You and the rest of the engineers do the work.

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**VCs take advantage...to maximize the return for the venture fund's investors. Engineers are getting short-changed.**

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One company I know got a good valuation a year ago. Over the year, it grew rapidly, developed its product, met or exceeded its milestones, and spent its money according to plan. When it was time to get money again, the funding environment had changed. Last year's main investor wouldn't "price" the shares or "lead" the new funding round. The "price" declares the number of shares and the valuation of the company. Think of the company as a pie. It is a certain size (valuation) and it is cut into a number of slices (shares). An investor "leads" by offering a specific price for shares for a large percentage of the next round. Other investors follow at the same price. Even though the company's engineers had executed flawlessly, the round came in at less than a third of last year's valuation.

As a part of closing this "down" round, the last year's investors renegotiated the previous round, effectively saying, "Since this round is lower, we must have overpaid in the last round. We want more equity for the last investment." If there had been fraud by the entrepreneurs instead of flawless execution, renegotiating the previous round might have been reasonable. Imagine the opposite scenario: "In light of market developments, it's obvious that your idea is worth much more than we thought, so we're returning half the equity we took for last year's funding." It's so ridiculously improbable that you can't read it without laughing out loud. That we accept the converse highlights the entrepreneur's weak position.

## Values at variance

The VCs know money and they don't care about the technology; the entrepreneurs know technology and they need money. Money knowledge applies across all the start-ups; the technical knowledge is unique to each. The VCs don't care about any single technology because they spread their investments across the opportunities. Knowing money isn't the same as knowing value. A year ago, VCs were lining up to give money to Internet dog-food companies; this year, they wouldn't back an inventor with a working Star Trek transporter.

It's financial; it's not technical or personal. To the VC, the engineer and the ideas are commodities. The venture firm squeezes the technical team because it can. VCs believe that they are exercising their responsibility to maximize return for themselves and for the fund's investors.

Reducing the engineers' share of the pie is counterproductive, however: they become demoralized; productivity suffers; eventually, they leave. Engineers are not commodities. Replacing a chip designer one year into a complex design delays the project six months while the replacement engineer learns and then redesigns the work-in-progress.

VCs don't appreciate that the electronics revolution is built on the backs and brains of engineers, not of executives. Moore's law and engineering talent drive the electronics revolution. Tremendous market pull for its products builds momentum. The pull is so great that the revolution is indifferent to the talents and decisions of its executives (legendary blundering causes only ripples), but it depends on the talent and the work of its engineers. The engineers are the creators of wealth; the VCs are the beneficiaries.

## Fixing the problem

The engineers building the future deserve a fair equity share in the value they create; today they don't get one. For them to get their share, wealthy engineers must fund start-ups. And they don't have to be Bill Gates to do so. "Qualified investors" can participate in pre-IPO funding. This means your net worth (exclusive of your home) must be at least a million dollars or you must meet minimum annual income requirements. These days, the millionaire's club isn't all that exclusive. Many engineers are qualified investors.

If you are a qualified investor, participate in start-ups as an "angel" investor. An angel investor participates in early or "seed" funding rounds. Don't do it with more money than you can afford to lose, however, because it is risky. To change the situation I'm describing, start-ups need your money and they need your advice. More money and more start-ups bring faster progress and create more wealth. Creating wealth isn't only about money; it's about quality of life and it's about raising the standard of living for everyone (but that's another essay).

Engineers should band together to form venture funds. Start-ups need more angel funding and they need better-organized angel funding. I'd like to see a dozen or so \$100 million venture funds run by nerds. These nerd-based venture firms would work at the seed round and at the next funding round (called the A round). They provide initial funding and advice and they, with the benefit of professional financial advice, represent their start-ups in future funding negotiations with traditional venture firms.

Here's a third suggestion. I'd like to see an engineer-run start-up whose goal is to raise \$100 million in a public offering. The money becomes a fund for sponsoring start-ups. It's a public venture firm and it sells shares to raise money. Investing in start-ups wouldn't be exclusively for rich people; anyone who could buy stock could be investing in start-ups. Ideally, the public VC firm would be managed and run by nerds with empathy for nerds in the start-ups.

I wanted to publicly thank more than a dozen people for help on this essay, but they all said "NO!" None can afford to have the VCs find out that they contributed.