Stanford eCorner

Early Silicon Valley Influences

Gordon Davidson, *Fenwick &West, LLP*

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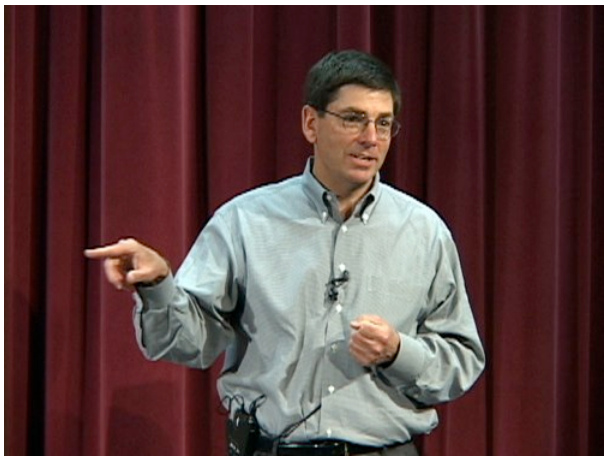
Early in his career, Gordon was influenced by some of Silicon Valley's great founders. He started out as a mechanical engineering student at Stanford and developed a strong relationship with a professor who challenged his assumptions and forced him to not be satisfied with an incomplete answer.



Transcript

I was once an engineer. People consider me a fallen engineer and now, I'm a lawyer and people consider me a recovering lawyer. You might wonder what the heck a lawyer is doing talking to you about Silicon Valley. And one of the things I thought of when preparing this speech is a lawyer in Silicon is a little bit like Forrest Gump in history. We're everywhere. It's just that you were looking at the other guy in the photo. And we are not much recognized but the clients that we serve are very well-known to you. I'd like to start, though, with a little bit of history, some of which you know, about engineering and what influenced me as an engineer. I know you know the whole story of Hewlett-Packard and the oscillators in Fantasia. I know John Hennesy told you about this a few weeks ago.

I just had to say it because every time I came to a double-E class at Stanford, we start it with the whole bit about Hewlett-Packard in the garage in Addison Street home. What I can tell you though is it made a very big impression on me and a very accurate representation of what goes on in startup companies even today. And I was influenced by a couple of people, some of whom you know. One is Jim Gibbons, I'll tell you about that; Doug Engelbart; Ted Hoff; and Dave Lawson; all of whom had ties with Stanford. I want to tell you just quickly a little bit about how they influenced my life as an engineer. First, you know the story about Hewlett-Packard. Jim Gibbons, who is still here over in the CIS Lab, was a young professor when I was an undergraduate here. He always timed in at 8:00 AM. He was a very busy guy. He had to talk to Washington, D.C.

in the morning, teach a class at 8:00, and then help his graduate students at 9:00 and then go off to help startup companies the rest of the day. A very, very impressive guy who really managed his time. He's still very active in Silicon Valley. He taught the introductory course in semiconductors and he wrote the textbook. And I learned from talking to the students earlier that the textbook is, alas, out of date but at the time, it was kind of cutting-edge, The Theory of Transistors. And we were a weekend into the course and had studied the chapter, learning all about the transistors and amplifiers, and he gave us a pop quiz. He walked into the class one day and he gave use a pop quiz. And he asked us to solve a circuit. I put there a little circuit diagram down there on the slide. That wasn't the circuit.

And we had to compute the current going through a resistor in a circuit. All we knew was that the model of the transistor was whatever the input is, the output is 100 times that. So you could this kind of recursive as a feedback loop. We do this recursive calculation and we get an absurd answer that was something like 4,087 amps. We all wrote it down and drew a box around in cross-edge engineering paper that many amps, except I wrote underneath "This answer must be wrong." And Jim Gibbons took all he blue books back and came back the next week and sort of tossed them on the table and said, "I'm very

disappointed in the class. Everybody got the question wrong and one student knew that the answer was wrong. I gave all of you a C except for the student who knew that the answer was wrong. I gave him a D." I went up to Jim at the end of the class and said, "Jim, I'm the only one knew it was wrong, right?" And he said, "Right." "Don't I get credit for that?" And he said, "No. I mean you realized you were wrong and what you should have done was step back and re-examine your assumptions. The one thing about this circuit you didn't know was what was inside that black box.

You could have, by trial and error, figured out what the steady state current through that resistor was and you would have known that the transistor was saturated. It wasn't an amplifier. It was a closed switch." We also would have known this if we would have turned to the Chapter 2 of his book but none of us have read ahead. And Chapter 1 was just amplifier. Chapter 2 was switch. But that is a lesson I carry with me everyday today. And I still see Jim regularly. He's on the board at Cisco Systems which is a client of mine. I play golf with him. You know, and I remind him of this story almost every time I see him.

And if you are a reader of the Stanford Magazine, you would note that an issue came out, this was just about a year ago, featuring teachers who changed our lives and Jim was one of the six or seven professors who was mentioned in that article. And I wish that they would have interviewed me because I would have told this story. They interviewed somebody else for it but he had and still has a profound impact on my life. And refers me clients and startup companies, and some of them make it and some of them don't. But it's a lot of fun to stay in touch with Jim. He helped me. He was actually my adviser during graduate school, helped me get a fellowship to pay for it and everything else. Another impact on my life was my first job. It's a summer job after I got my Bachelor's degree at SRI International which used to be Stanford Research Institute. And luckily, I had no clue of its importance in history but I worked in a lab called the Augmentation Research Center led by a fellow named Doug Engelbart who happened to invent the mouse, Windows keypad that really doesn't use an input device, and using what was called the ARPANET, the precursor of the Internet.

And it was a lot of fun. I mean I interfaced a mouse to what today you would call a personal computer or workstation. I had no clue of the importance this would have in our lives and computing. It was all very far out research stuff that was only available at SRI. But he was a very, very, very charismatic fellow to work with. Then during my graduate year, over at a lab in the basement of the colored building next door. We were given the task of interfacing a video camera to a computer. The computer was an HP2100 which has 32K of memory and that was it, 32K total memory. My watch has more memory, probably, than that had in it. Our adviser was an adjunct professor named Ted Hoff who also happened to be the Chief Technology Officer at Intel Corp.

And we were basically trying to figure out how we could create a buffer memory to get all that video data into the computer fast enough. We were soldering transistors together. We were going to die. It would be 10,000 years before we soldered enough transistors together to create a memory. And he walked over to us one day and reached into his pocket and dropped a whole bunch of chips on the desk and said, "Don't tell anyone where you got these. These are experimental chips at Intel. They are 1 kb RAMs and you can use them. It will save you a lot of soldering. In fact, we did. We wired them all together and so we had a buffer memory.

This was in '71. Intel went public in October of '71 at, in today's terms would be two cents a share. And today, it's trading in the high 20's. We had our nose so close to the bench, right up against the soldering iron that none of us thought to go out and buy Intel shares after finding out about these chips. And that to me is the single reason why Tom Byers needs to teach entrepreneurship at the engineering school, because we all need to recognize the importance of what we do. I mean Doug Engelbart never made money in the mouse. We never bought Intel stock. Ted Hoff certainly reaped some of the financial rewards by being an early employee there. But we were so fascinated with the technology that we didn't understand the business-end implications.