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Interview with Steve Wozniak

Passion and entrepreneurship in a world gone digital

Finding people who want to do a job better than anyone else is key to success in the digital economy, says the Apple cofounder.

Steve Wozniak had wanted a computer of his own his whole life. He wanted to be able to take it anywhere, solve problems, do engineering—in his words, “to have fun.” So in 1975, at the age of 25, he built himself one. When his friend Steve Jobs saw Wozniak’s computer, he saw potential. The rest, of course, is history.

At the time, Wozniak was designing Hewlett Packard calculators, beloved by the geek set. He was happy in his job, and because he was a loyal employee, he offered to sell the company his computer. HP, however, turned him down—five times.

When he and Jobs started Apple, neither could have imagined the extent to which computers would eventually transform society. What really inspired Wozniak was a Stanford professor who spoke to his computer club—the Homebrew Computer Club—and pointed out that someone could write a computer program, input the company’s financials, and the computer would come up with valuable information about the company, based on that data. Wozniak realized that computers were going to make “a little geek like me a hero at work.” Otherwise, as he recalls, “You know, you’d go into work and you’d always be ignored.”

No one would ignore Steve Wozniak now. Respected not only as a brilliant engineer but also as a forecaster of what is to come in technology, he now divides his time between philanthropy and serving as chief scientist for Fusion-io, a Utah-based company whose high-capacity platform significantly increases data center speed and efficiency. In May, at the Accenture Digital conference in Madrid, Wozniak shared his insights with Mike Sutcliff, group chief executive of Accenture Digital. As for future technology breakthroughs, Wozniak’s own hopes are fairly modest: a robot that can find his kitchen, the coffeemaker, beans and water—and make him a decent cup of coffee.

SUTCLIFF: Looking at technology today—looking at the combinations of storage, of computing power, of communications all coming together—what do you see as the biggest opportunities?

WOZNIAK: The data centers are where the computers have moved to. You used to have your own computer. Now you have a little display that shows what other computers are computing out on the Internet. They are taking the sources from hard disks or, better yet, from nano flash memory chips plugged in, and they’re making a great experience.

What can companies do with that?

One company might go online and say, “Oh, we can put a database of some medical facts up on a server, and then you can have it available on your computer or your mobile device.”

But what’s happened [that’s] even more astounding than that is that I’m seeing people take one aspect, one huge database of the Internet, and then start relating it to other databases that are available and other communications methods and start forming ways that things can come together a lot more. It’s not like one database can give you the answer. You get to do a lot of comparison, and then one database might suggest other things. Maybe you’re going to run a navigation; your navigation database checks where there are street problems.

What do you see coming next that looks particularly interesting?

Robotics is going to be big in the future. I always like to talk about, “Could anyone ever build a machine that could make a cup of coffee in my house?” Someday a young kid who has in his mind that that’s going to be his life goal, it’s how it’s going to happen. Young people don’t see the boundaries.

What else would you like to see?

I'd also like a little robot that sits in my driveway. The Roomba robot goes around a room randomly and vacuums it while you're gone at work. I would like to have a little machine that sits in my driveway and moves around or walks around and finds its way. It spots the car, and it cleans one square centimeter at a time, all night long, and when I wake up, my car is cleaned.

What else can we expect to see?

Nice little fanciful ideas that apply to normal every-Joe life are coming. Robotic cars are going to drive themselves. Everybody feels they're going to be a lot safer, because we're human beings and we're not perfect, and we might miss something, not see a stop sign. They're going to notice anything coming from all angles much more quickly than the human eye and brain, so I'm looking forward to that.

I learned from your book that you're a famous prankster. I enjoyed reading about the early experiences you had using technology to pull pranks on different people.

We had a lot of fun at school playing pranks. We had driver training at our high school, so I built a little device that was a police siren to see if anybody would pull over.

I'm sure that many executives are thinking about innovation in their companies and how to spur innovation internally. What drove you to innovate and create a computer?

I was in engineering. I had never taken courses in writing a computer language. I taught myself how to do it. I had never worked with a floppy disk before—any disk drive—hardware or software. But if you're one of those people that's capable of looking at a problem, and knowing how to use the building blocks of the day and figur-

ing out the way to create it, the best way possible, you will.

My motivation on the floppy disk drive was, if I got one developed in two weeks, I would get to go to Las Vegas. Apple was going to be allowed into Las Vegas [at the Consumer Electronics Show] with three of our people. Steve Jobs and Mike Markulla, who was our investor, and Mike Scott, our president, were going to go. Not me. But I said, "If we have a floppy disk, can I show it? I'll get to see the beautiful city that I've always wanted to see."

That kind of motivation, you can't buy with a salary or stock option. It's when it's personal and it's a passion, deep inside a person, maybe trying to prove their own ideas—that's when you get incredible products and incredible work.

So you never want to tell a person their ideas just aren't right, it's not the way we do it. Corporate culture sometimes gets in the way.

It's an exciting time to be an engineer. When you were growing up, there were a limited number of people in the world that were exposed to the electronics, to the tools, to the techniques. Now, with global learning and free open courses like the one at Stanford, you've got the whole world at your fingertips.

Sure. You can get a university computer engineering education online if you are the right sort of person that can learn from a stale computer that doesn't have a personality. But there are some difficulties with that methodology, and it doesn't apply to most people. But you're not limited. When you're on a computer, if you're exploring some category of education, you're not limited. You can go off on tangents and study other things that are related. If it's in your heart, you can go as fast as you want.

I remember my third year at college. I chose all "master" courses in hardware and software design. I would buy

the books on Friday, and I would go through the books answering every single question at the end of every single chapter, and I'd be halfway through the book by the time class started on Monday. Why? I loved computers so much. I just loved it.

But most schools tell you that you could only learn certain pages on certain days, because that's what the test is going to cover.

Someday we'll get to the point where you just go online and whatever you want, you can go and learn and become [an] expert at.

As far as electronics, we have a lot more to learn. One of my sons is just about to graduate in computer engineering, so computer engineering is still around and we still need electronics. But [it's no longer a hardware world where] everything [is] formulas, difficult formulas, differential calculus equations to calculate what circuits would work.

And we still have a little of that in our life—and some of that is still left over in some of our radios—but pretty much the world's gone digital, and you don't need that sort of difficult mathematics. You don't need calculus, you don't need any more mathematics than you get by the time you're 10 years old to develop any of the digital stuff. And the world's gone to software, really.

Where are you in all this today?

A lot of people want to be software only, but I like computer engineering, because the computer engineer is the person that knows the hardware deep inside and can write software for it. And that's where I came from. It's about understanding those levels; you can take advantage of things better and get a better output.

But you know you have to have the motivation. You've got to find those engineers, either inspire them or find the ones that just want to somehow be the best in the world, be better than someone else at whatever job they're doing.

What characterizes them?

I remember, sometimes I'd finish something, I'd think, "Is there something I can do, looking at all my formulas, my code, that I could cut some out, that I could reuse some or condense a couple of equations into one, for my needs? Is there a way I can do the job a little better than almost anyone else in the world would do?" So I always recommend that to young people.

Have you had much experience around young people?

I taught, because it was a lifetime goal of mine. I taught fifth-graders for eight years, and I noticed that the top students would always do more than I assigned them. They'd add something else into the formula, do something a little bit more—unexpected. That's the sort of person you want to look for, that's creative, the person that can create something on their own, that doesn't want to just stick with the world the way it's given, and think, "My answer's the same as everyone else's."

What can CEOs do?

Look for builders. You want entrepreneurship in your company. The people that have worked on projects and that built them are worth a lot more than the ones that just come up with ideas. And include those people in the ideas stage.

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