



Steve Wozniak on Apple, Steve Jobs and the Value of a Good Prank

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Steve Wozniak, or "Woz" as he is commonly called, is best known for co-founding Apple along with high school friend Steve Jobs. But Wozniak didn't set out to establish one of the world's most influential computer companies. His goal early in life was to be an engineer and a lifelong employee of Hewlett Packard -- and to have enough spare time to tinker with electronic gadgets.

It was that desire to design clever electronic devices that led to many of Wozniak's early inventions. While a student at U.C. Berkeley in 1971, Wozniak read an Esquire Magazine article on the "phone phreaks" who illicitly explored the telephone network. He figured out how to build his own electronic "blue box" to generate the tones required to make free long distance phone calls. In 1973, he started the first "dial-a-joke" hotline in the San Francisco Bay Area out of his home, telling all the jokes himself. While working at Hewlett Packard, Wozniak continued to design electronic devices in his spare time, and in 1975 created the first personal computer that used a keyboard for input and displayed characters on a television screen. Wozniak would demonstrate his new computing device at meetings of like-minded Silicon Valley electronics hobbyists known as the Homebrew Computer Club. Too shy to give a public presentation of his work, Wozniak would show his engineering feats in informal conversations following the meetings.

Wozniak's early entrepreneurial ventures were closely intertwined with the activities of his high school friend and current Apple CEO Steve Jobs. It was Jobs, four-and-a-half years younger than Wozniak, who suggested the two sell Wozniak's "blue box" device to students in the dorms at Berkeley. While Jobs was working at Atari, he persuaded Wozniak to design the arcade game Breakout (and, in a story recounted in Wozniak's autobiography, iWoz, reportedly misled Wozniak about the amount of the payment they were to split). And most famously, it was Jobs who realized that rather than merely sharing the schematics of Wozniak's early designs for a personal computer with fellow hobbyists, they could assemble the components on a printed circuit board and sell a complete computer which, following funding from former Intel executive Mike Markkula, led to the founding of Apple Computer in 1976.

While he officially remains an Apple employee, Wozniak's involvement in the company today is relatively minor. After he was injured in an accident piloting his private Beechcraft airplane in 1981, Wozniak decided to return to U.C. Berkeley to complete his degree in electrical engineering.

In the years following, Wozniak sponsored two Woodstock-like music festivals known as the US Festivals in 1982 and 1983, taught computing to grade-school students, and devoted much of his time and money to philanthropic activities. His current interests include playing Segway polo -- that is, playing polo while riding the Segway Personal Transporter in lieu of a horse.

Wozniak was awarded the National Medal of Technology by the President of the United States in 1985, was inducted into the Inventors Hall of Fame in 2000, and received the Heinz Award in Technology, the Economy and Employment in 2001.



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In 2006, Wozniak published iWoz: From Computer Geek to Cult Icon: How I Invented the Personal Computer, Co-Founded Apple, and Had Fun Doing It, about his life before, during and after Apple.

Knowledge@Wharton spoke with the 57-year-old Wozniak by phone from his home in Los Gatos, Calif., on a wide range of topics: founding Apple, his relationship with Steve Jobs, his fascination with pranks, and his planned upcoming appearances on Kathy Griffin's television show, "My Life on the D List." An edited version of that conversation follows.

Knowledge@Wharton: What got you originally excited about math and science?

Steve Wozniak: I can't pin it down to an exact date. I wanted to be like my dad. I'd go to where he worked and see him hook up wires and get signals to appear on screen.

But I wasn't sure I was cut out for that. And then about third grade my mom practiced flash cards with me in the kitchen. [In] school, we had a multiplication test and I beat the girls. And the teacher said that was really strange. So I started thinking, "Woah, I'm good at math."

That was probably the first time I can remember thinking, "Hey, there's something I'm good at."

Knowledge@Wharton: From reading *iWoz* one gets the sense that you were an "accidental entrepreneur" rather than someone who set out to found a company.

Wozniak: I was very skilled at a certain kind of computer design. I could just do magic that other people couldn't do. I knew I'd build a computer when it was possible. That year [1975] was the year it was possible.

As far as starting a company -- no, I was so happy with my job [as an engineer at Hewlett Packard]. I could have been an engineer for the rest of my life, had enough income to be happy and designed things in my spare time.

That was what drove me. I wanted to show off my design techniques -- and help the world get to this big, revolutionary point.

Knowledge@Wharton: The other thing that comes through in your book is that you're quite the prankster. What about pranks fascinates you so much?

Wozniak: I don't know. Some people go to comedy clubs, some watch sitcoms, some watch comedy movies. It just feels good when you laugh!

I like cleverness, too -- it's very much like creativity.

I admire people when they think of unusual things other people wouldn't have thought of. But even [when you're] repeating a joke you've heard, it makes people laugh.

I grew up at a time when there was no political correctness in jokes. I told Polish jokes on the first dial-a-joke ever in the Bay Area.

And then the world started saying, "Don't criticize people of certain nationalities. Don't stereotype." And then it moved [to]: "Don't even mention their name -- even if you don't criticize them in any way -- don't mention a word."

I have always felt the laughter and humor you generate in people almost always outweigh the negative of a person who feels offended -- whether rightly so or not.

Knowledge@Wharton: With that change in climate, is it harder to be a prankster now than it was back in the '70s?

Wozniak: I believe that it is. A lot of my old pranks and jokes are forbidden in today's schools. The schools underwent this big [change where] the kids cannot do [anything] random, outside-the-rules, outside-the-pages-in-the-book. They can't be that individualistic.

In California we [have] so little money for schools. And when you don't have much money, you have to have large classes and you don't have enough teachers to allow the kids to randomly go in the directions that they're made by God or by nature to go.

If you imagine something beyond the boundaries you can see -- like future products or space travel -- you get taught from an early age, "This is disallowed." You have to do it secretly on your own.

Allowing some level of mild pranks -- with a rule that it's not going to harm anyone -- would be a good policy.

I [did] that in my own computer classes with young kids. If you could get on to someone else's computer and hide things from them and get them all excited, it was okay -- as long as you could restore it easily. And they never once disobeyed that rule in eight years.

Knowledge@Wharton: It sounds like you think this is more than just having a good time. In terms of education, you seem to believe this underlies teaching people how to be creative and inventive.

Wozniak: Exactly. Humor is closely related to the creativity and invention that we're born with. It's that spirit of thinking out something a little bit different -- making up your own jokes.

Knowledge@Wharton: You mention in the book that you and Steve Jobs "were always different people...right from the start." How so?

Wozniak: We were very similar in certain ways, like the values [we had] as we grew up in our high school. We were both leaning towards the counter-culture. Steve was more a part of it and I was more mainstream -- feet on the ground, none of these drugs and all that.

Steve and I would have conversations and get excited about the same technological possibilities.

I was more the humorist; I was more the expert designer. But we shared common interests. We were friends for eight years [before] we started Apple.

It was after we started Apple that we defined our roles.

Steve's role was to learn how to run every aspect of a company, to be an executive at every level. I had already come to a very non-political point in my life where I didn't want to run a company, because I didn't want to push other people around, act superior to others, tell them what they had [done] was lousy. So I just said: I will do my engineering as well as it can be done, and I'll do that perfectly. I won't tromp into other people's territory.

So we went into two parts of the company. And from then on, we were very much working on different things almost forever.

Steve did an excellent job of melding the marketing, operations and technology. He understood which technology was good and what people would like.

It was a weird situation. He couldn't design a computer -- he was never a designer or a programmer -- but he could understand it well enough to understand what was good and what was bad.

I think that was more important -- having one mind that could put the entire landscape together. Whereas I just did one piece excellently.

Knowledge@Wharton: It sounds like the two of you complemented each other in those early years.

Wozniak: Yes, I believe that with families and friends it's much better if you're closer in personalities and values. In the case of Steve Jobs and I, we've always remained extremely close in values, with just different personalities.

In a company, you've got so many things that have to come together [that] it's difficult for one person to do it. If you have one person at the top who is very thoughtful, you get the excellence and the integrity of one mind conceiving how the company works.

Steve had the spirit: "We're doing something new. We're going to be doing something great." [He had] the drive [to do] everything from publicity to finding the last part in the world when we desperately needed one and calling stores and talking them into selling our computers. He was excellent at that.

Knowledge@Wharton: Looking back, how do you think your life would have been different if you had never met Steve Jobs?

Wozniak: I think that I would have been as humorous and happy as I am, and have the good-quality friends and the things that I love in life.

I don't know if I would have ever had the money to have a house. We were in our twenties when we started Apple. We had no savings account. We didn't own a car. We didn't make anything like the money you need to buy a house in California, even then. We didn't have any experience in business. If I got some money, I'd go out and buy some electronic parts and build something.

The company I worked for, Hewlett Packard, was a big part of my life back then. They had such incredible values [that respected] engineering. I wanted to work there forever. Hewlett Packard has changed over time. It's not the same company that makes high quality products that other engineers use like they used to.

So, I probably would have had some ups and downs. But I was so excellent at what I did electronically, I would have always had a job.

Knowledge@Wharton: How do you think Steve Jobs' life would have been different if he had never met you?

Wozniak: It's hard to guess, because it could be either way.

He had those skills of organization and a drive to start a company. [If he had never met me] he would have done it with somebody else's product.

He might have wound up just exactly where he is: a top, wealthy businessman who created great products. He really wants to move the world forward and not be just another company making the same old thing to earn a buck.

That was exactly what he wanted the day I met him when we were in high school. He admired these top people in the world -- the Newtons and the Shakespeares. He thought that there were very few people who had really changed life forever for all of us. He obviously wanted to be one of them.

And me, I wanted to create interesting technical products and write great programs.

I got interrupted more than him. I mean, Apple's success and the publicity and fame made it very difficult for me to get the time to just work in my own garage and put things together.

Knowledge@Wharton: You mentioned that, in the early days, you and the other people in the Homebrew Computer Club were excited about how the computer would benefit humanity. To what extent has that happened?

Wozniak: The computer has benefited humanity 10 times more than we ever could have imagined.

We were all loners. We were people who knew technology but didn't have money. We didn't imagine ever owning or even using a computer.

We [saw that] there were silicon parts coming that were going to make it possible to build computers that human beings like us could afford. Those of us who knew how to program a computer would write programs and would solve problems that our company couldn't solve on their huge mainframe computers. And we'd be changing the world more than CEOs.

Look at how inspiring that is.

As we were building these things we didn't really know for sure it would happen, [whether] it would be affordable. Now everything is on a computer. Every desk has a computer doing business stuff all day.

For entertainment, we have all of our movies and music [on the computer]. Whoever thought a song would fit on a computer back when we started the Homebrew Computer Club? Entertainment is a huge part of our life that the computer has taken over.

And communication -- I don't even have to say anymore -- from instant messaging to e-mail and video chats.

The blending of your computer and the cell phone is so amazing. There weren't cell phones back then. When we started Apple, in the United States you still could not legally own your own telephone.

It's difficult to think too far into outer space and be correct.

Knowledge@Wharton: Are there ways in which you think the progress has fallen short? Are there things that the computer ought to be doing for us but the technology just hasn't gotten there yet?

Wozniak: Yes. We keep talking about artificial intelligence: "The computer's going to be like a thinking brain. It's going to be more powerful than our brain." That has not happened.

[The] graphics look real and the voice quality sounds like a real human voice. Computers [have become more] human in that way, but not the way a real human being is.

If you're dealing with a human being, they look at your face, they notice your condition. They know what words to say, when to talk. They get different ideas to [move the conversation] in different directions.

Artificial intelligence hasn't gone to one on a scale of a hundred to represent a real person who's lived a life and knows who you are and wants to ask questions about your family and your pets.

I think we're way, way behind. [In the Homebrew Computer Club] we envisioned that computers were going to be like the intelligence and the behavior of human beings.

Knowledge@Wharton: Any sense about how far off that day is?

Wozniak: I don't see it ever.

I throw out an example once in a while: Could you build a robot that could make a cup of coffee?

First, people say, "Well, that sounds simple." And the answer is: It'll never happen.

You could come into my house and you might be able to make a cup of coffee. I could go into your house and I might be able to make a cup of coffee. Think of all the steps a computer would have to analyze -- walking through your house, trying to figure out where a kitchen might be. If you have a coffee machine, figuring how it fits together. We'd know to open a drawer and look for a filter, because we've used coffee machines. We've lived a human life.

[Can] a computer create art? You could write programs that make music that sounds okay -- it uses the right notes or the right scales -- but it wouldn't be great art. Because you have to judge it. How could a computer judge art -- even a painting -- if it's never experienced the human feeling of a breeze on a beach?

You'd almost have to have a robot that grows up. Maybe it could live life a little faster than a human. But it would have to go through a lot of steps we go through to have the same feelings of what's important in the world.

Knowledge@Wharton: In your book, you say, "The most important measure of a person was truth."

Wozniak: I believe that to this day. It's just been a mainstay of my life, my personality.

Knowledge@Wharton: In the book you also recount how, when you developed Breakout for the Atari, Steve Jobs sold it and told you that he received \$700 for the two of you to split while, in fact, he had been paid a few thousand dollars. Although, in hindsight, the money is rather irrelevant, how do you feel about the ethics of this?

Wozniak: Yes, the money's irrelevant -- and it was then. I would have done it for free. I was happy to be able to design a video game that people would actually play.

I think Steve needed money and just didn't tell me the truth. If he'd told me the truth, he'd have gotten it.

He should have known me well enough to just come out and say he needed the money. It would sound odd, me doing the entire design and him getting all the money. I would have done it. He was a friend. You help your friends.

So, it's understandable. It's really a small issue.

When you judge Steve as a person -- the great things he brings to the world versus, maybe, these encroachments on personal decency or personal honesty with other people or disrespect of people when they've worked very hard and do a great job and he'll say, "Oh, that's just shitty," that sort of thing -- those are probably outweighed by the good that he does for the world.

We can sometimes see the future -- that, for example, all of our television signals are going to come over the Internet, all our entertainment and phone calls and music. Movie theaters even might go away some day because the Internet has taken their place.

How do you actually get there? It is so difficult to try to move the world to change, especially when there are money interests involved.

What Steve does on the good side -- like the music scenario [in which] we didn't bring just a music device called the iPod, we brought a whole music system: a store that sells it, a computer that manages and organizes it. And an iPod is just a satellite to your computer. Plug it in and it works. You don't have to do anything.

You've got to admire Steve for that kind of thinking.

Nobody's perfect. [Everybody is] going to have cases where they did something bad to somebody, said something nasty to them and maybe regret it later.

Knowledge@Wharton: When you taught computing part-time to fifth grade students after you left Apple as a full-time employee, you said that was the most important time of your life. How so?

Wozniak: It was a great time in my life for a lot of reasons. I'd been doing a bunch of philanthropy in San Jose. I felt very good about giving away my money to start good museums: Children's Discovery Museum, the Tech [Museum] of Silicon Valley, a ballet company.

I had wanted to teach my whole life. I just started up a class by inviting a few kids over the phone -- one year's class had six students only.

Then I moved up to 22 kids. Then I started doing multiple full classes of 20 and 30 kids. I enjoyed it so much. I was sharing something I was good at with the kids, and I was helping them make their homework better.

I was not trying to make them be computer people like myself. I said: I have to reach everyone in the class, not just a few who want to be weird little geeky people. I want to reach everyone.

So I taught the kids how to make their homework look good. If they were assigned [a report] I would say, "Let's do the report on the computer. Here's how we can choose the right fonts and make it look good." If they were assigned some history project [I'd say], "Let's do a timeline in the drawing program." Or, "Let's do a spreadsheet with some charts to show some data that you're analyzing."

I would take the real stuff they had in school, and after school I would do [it] in my computer class.

Knowledge@Wharton: In addition to being a stockholder, you're still technically an Apple employee?

Wozniak: Yes, out of a strong loyalty to the company. I want to remain an employee forever.

Knowledge@Wharton: How active are you in the company at this point?

Wozniak: I'm not active. There are times that I wish I were. I pay attention to the products going on.

I think that it would interfere with Steve Jobs' management control to have me around. It would confuse issues.

But I'd be open to it at some point.

In the time I've been away, I've had a full life going in other directions -- I had my classes, I've had a few start-ups.

I really enjoy getting down with young engineers and trying to start a company.

I'm about to go off in a big educational direction right now with a company that's selling educational software and hardware. I'd like to take it to the next level and think [through]: What kind of tools do we need to do education better?

I have so many ideas on education -- what's wrong and where it fails.

Knowledge@Wharton: What are your thoughts about this?

Wozniak: Education is so huge -- you can't have one quick solution. The solutions are very far in the future.

We technologists can figure out how to get more education at a lower price. That's a big key. But the amount of money for education is always going to be too low.

The government has a certain amount of money to spend on things. And you think, "Oh, they're just going to determine the priorities: Here's what percentage should go to education, what percentage to the military, what percentage to forestry, what percentage to roads."

But those percentages tend to map to how many votes there are. And there's a little problem in the United States: A family of five gets no more votes than a family of two. So, the families with the kids, [for whom] education is a top priority, don't have a say [proportionate to] the size of their family. Kids aren't really considered in the votes and [in the] money for education, which is just backwards.

Every farmer gets to vote on farm bills. Every elderly person gets to vote on elderly issues. Schooling is a problem because young kids don't get to vote.

Knowledge@Wharton: You said earlier that there were times when you wish you were more involved with Apple.

Wozniak: It would be great to be looking at the technologies that aren't well known and trying to decide which we could build into a cool product and at what price.

It's hard to say that Apple is the same place it once was in that respect. Apple's often trying [to see] how you cram things into a certain space, [focusing on] style.

I became very influenced when our Lisa and Macintosh computers came out with this whole new world of mice and menus and windows. There was this phrase [at the time], that "it was intuitive." The computer had been molded around you as a human being and it worked *your* way.

Now I feel we've stepped way back. The computer has all the functionality, but it's not like you would have designed it. You're more of a slave than a master.

Computers are supposed to work the way you thought they would. You -- the human being -- should be more important than the technology.

There's no incentive for companies like Microsoft or Apple to make things really good. Apple and Microsoft won't sell one more [piece of] software or hardware based on it [being] adequate versus [being] great.

Knowledge@Wharton: It's surprising to hear you say that because many people would argue that elegance and ease of use have been differentiators for Apple. You seem to be saying you don't think they've gone as far as they should in that area.

Wozniak: We did so much in the early '80s to think [about this]. We had "user interface guidelines" that programmers were supposed to follow so their programs would look and work like other programs did [so] the user didn't have to re-learn it.

We put people into blank rooms with something they didn't even know was a computer -- a screen and mouse and a keyboard -- and we'd tell them, "You figure out what you can do with it." They weren't told what the heck they were doing. They were not computer people. And they had to figure it out.

We'd go behind two-way mirrors and watch what worked and what didn't, what came naturally to human beings. That's what intuitiveness is.

Knowledge@Wharton: In the book you say that when Steve Jobs came back to Apple in the 1990s, it restored some of the passion and commitment that the company needed.

Wozniak: Yes, because our most valuable asset has always been our very loyal customer base. And they were missing something in the products that were there [at the time]. When he came back he introduced the iMac, although that had been in development before him.

Apple had horrible problems with everything that was coming out being leaked a half a year ahead. It was not exciting when it was actually introduced. And Steve put [in place] real strong guidelines: "You talk to the press and you are fired."

I was glad that Apple tightened things up. That's part of what creates the passion -- a new product comes and it seems new.

Knowledge@Wharton: Have you given any thought to what a post-Jobs Apple might look like? As a shareholder, are you concerned about Apple's seeming lack of a succession plan?

Wozniak: I am concerned about it. But Apple has a big advantage that no other company has: a history, a culture, a lot of users who think a certain way.

So whoever replaces Steve Jobs -- or which people replace him -- if their values aren't very much like his own, there will be a lot of grumbling and there will be a shake-up, and [they'll] try to find somebody who works more like Steve Jobs did.

You can win and fail. I've watched the movie industry bring in people who were just great at making [certain] kinds of movies and they got in and all they were, were shysters making a buck. [They] didn't bring the magic they [had] before. When they start giving themselves \$10 million salaries and that kind of stuff, you can't expect that you're going to get great art.

Knowledge@Wharton: You talked about the importance of the user base and its commitment to the company. Many people love Apple in a way that's unique among technology companies. Is there a lesson there that other companies should learn from?

Wozniak: [People with] PCs just talk about using them. Those with Apples love them.

We've also had to fight some strong battles to save our lives. The school district people would come in and say, "We've got to replace every Macintosh with a PC because Apple might go out of business [and the PC is] so much cheaper."

We had to fight for our existence. And that makes you extremely passionate.

The funny thing is, the style of the machine -- how the menus are, where they are, where things are on the screen, how the windows come up, things like that -- these have changed for the Macintosh, but they changed gradually, one [revision] at a time. So we feel we're always in the one same world we've always been in. If you actually went and looked back, you'd say, "Oh my gosh, I remember when we did it that

way." It still does the same thing; it does it differently.

Now we've got this club going. It's a little *too* church-like for me. I don't like that part of it.

Knowledge@Wharton: You think it's better if people are critical even if they're fans?

Wozniak: I think they should be critical and look at what are the good values Apple brings. We should get closer to those values. And when we stray from them, don't say: "Oh, it's Apple" -- so we're doing the right thing. No -- "It's Apple, but you're missing [something]."

Knowledge@Wharton: One of the things you said in the book that some people might find a bit surprising is, "In some ways, Apple is the bane of my life." How so?

Wozniak: Everywhere I go, everybody's coming up [and saying], "Oh, you started Apple" and they want attention. I'm a nice guy, and I talk and I spend time with them.

Yesterday I went down to a restaurant and met with three young kids just out of high school who want to start a company. They have an idea -- and it's actually a good idea. I'll give them my time and my advice as best I can. I'll call friends to help them.

That was an important time of life. I want to be there. I like to be a helpful person. But it takes a lot of my time.

E-mail was what really nailed me. I had a lot of free time. [I was] kind of retired. And now with e-mail, I'm on the computer all day long just trying to keep up with the news feeds. And technology analysts seed me with stuff -- and then friends and fans.

I always had this philosophy of being accessible. So I get lots of people calling me and e-mailing me all the time. And I can't keep up with it.

It's just horrible. Sometimes I'll get a month behind in answering one of my own kid's e-mails!

Knowledge@Wharton: Speaking of attention, you're a famously shy person. Are we really going to see some of your personal life on camera in the upcoming season of Kathy Griffin's "My Life on the D List"?

Wozniak: That's true, I was always a shy person [although] I don't call myself shy now.

With Kathy, it was almost a joke, a prank, started on her side. I joined in as I like jokes and pranks. It turns out after we met [that] I truly admire her. She's so bright, so quick thinking. I wish I could be that quick thinking.

I am going to be on the "D List" show. I'm going to the Producer's Guild awards with her and they'll be filming me picking her up and [giving her] some gift I'll have to come up with. She and I are also going to be the king and queen of the Humane Society of Silicon Valley's Fur Ball in April or May, and that's going to be on the "D List" show.

[I'd like to] do a "D List" [episode with] her coming to one of my speeches [to give] a little flavor of what I go through. It's a lot of people coming up to me: "Oh, thank you, thank you." Well, they're thanking me for things [created] much later. But it's just because they feel so good about Apple.

They treat me kind of like Henry Ford. Like, if you could run into Henry Ford [and you'd say], "Oh, thank you for what you did. I just love my car." It has nothing to do with [your] car. But I can understand it.

And I hope some pranks are on [the show]. I have some good ones, but they limit what you're allowed to do.

She was not that super-receptive when I took her to the Emmys and I brought her a few of my favorite little gag gifts, like a whole pad of two-dollar bills that tear off like green stamps.

I had a big Tiffany box and she'd open it up [and find more] fancy Tiffany boxes [inside]. Way down in

the inner ring box I had a little one-dollar rubber ring that you press and it flashes.

[But] we get along extremely well. We've had a lot of experiences with the life we've led and what it is like when you are sort of famous and you have to have assistants to handle a lot of your life.

She's the first person I've met who's in the same place I am in that regard.

Knowledge@Wharton: What are you most proud of having accomplished in your life thus far?

Wozniak: I used to answer that with something like dial-a-joke. But actually, [it was] creating the Apple II computer. Without it, things would have gone a lot differently and slower [with the development of] personal computers.

I had so many brilliant engineering ideas in there. So I'll have to pick that one.

Knowledge@Wharton: What have you not yet accomplished in your life that you still hope to do?

Wozniak: Well, I haven't had grandchildren. I'm not married; I'm divorced. Am I going to die with somebody else in my life?

Technically, I wish I could contribute to that area of artificial intelligence I was talking about earlier. I'd love to apply it to education -- make a computer a different kind of teacher. Change the paradigm of schools -- where you go to school and you may be going at a totally different pace than all the other students, but you get to hang around your friends in the same classroom. You aren't separated from your grade, but they might be doing material that's three years beyond you, because they went faster with an individual teacher that is the computer.

Knowledge@Wharton: Looking back over its history, is there anything you wish that Apple had done differently?

Wozniak: I don't like to look back. There was a time that I wished [Apple was] doing a different thing [regarding] licensing our operating system.

Our real crown jewel was the operating system. That's what all of our profits came from. And my feeling was we'd get just as much profit and not have to do the hard work of setting up factories, [managing] inventory, buying stuff and scrapping bad computers.

But I don't like to look back because you can't say that Apple would have been better or worse if it had done that. Maybe they would have been a Microsoft and had a bigger market share and been a bigger company. But maybe they wouldn't have been even as good a company [as they are now].

Do we need another Microsoft as much as we need what Apple is?

Knowledge@Wharton: Other than Apple, are there other companies that you admire?

Wozniak: I certainly admired Hewlett Packard when I worked there. You could speak to anybody up and down the management of the company. You could talk to the owners of the company, [Bill] Hewlett and [Dave] Packard, anytime.

I try to model my own life after that.

There are cases where, even at a company like Apple, your boss won't let a vice president ask you to go to Macworld. "You have to go through me." That sort of thing.

There are times I admired some European companies for their beautiful products -- Bang & Olufsen being prominent among them.

Another company I think is good is Mercedes-Benz. I drive a Prius, but I have a Mercedes-Benz and when I get in it [I see how] they designed the car around me, the human. I'm the center of the world, and everything is well thought out. When I speak speech commands to it, they work. I get in my Prius and it's got every little electronic thing in the world and you can never find your way. It's almost like the technology was more important than I was. You push the button forward to go backwards, and

backwards to go forwards -- that sort of thinking.

So, I admire Mercedes-Benz and I always have.

I can't say that I don't admire Microsoft, either. They have such a huge, huge job -- you can never satisfy so many people. And yet they manage this incredibly huge worldwide business.

There are a lot of countries Apple can't even get in, doesn't have to. When you don't have to do as big a job, it's easier to look better.

I think that Macintoshes and [the earlier Apple computers] are better. Usually the only thing [you hear about] a PC is: Well, it's cheaper. That's a benefit to people, too.

But Microsoft has always been after technology that can help people, and does things at very reasonable cost. So, I don't think they've been as horrible as some people [make] them out to be.

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